



FRIDAY, JANUARY 21, 1876.

### Why the Potter Law Should be Repealed.

The Wisconsin Legislature is petitioned by the leading railroad companies of the State to repeal the Potter law, and in support of their petition they have presented an argument, printed in pamphlet form for general distribution. This argument, an abstract of which is given below, was prepared at the request of Mr. Mitchell, President of the Chicago, Milwaukee & St. Paul Company, and Mr. Keep, President of the Chicago & Northwestern, by Mr. J. W. Midgley, of Chicago, a gentleman who has made the question his special study for a long time, having prepared the memorial to the same Legislature last year, and done other similar work, showing a thorough knowledge of the special case and of the general question of legislation affecting railroad tariffs:

Whoever renders a desired service is entitled to just compensation. It becomes, therefore, necessary to consider what is a reasonable rate. The Legislature may declare that rates shall be reasonable, but the Courts must determine whether they are or not. Upon this point English and American authorities are agreed. Their conclusion is "that a common carrier can afford to carry at much the same rate of hire as that which is exacted universally by carriers similarly situated, and which, if it has been found to remunerate them, may, upon the best grounds, be called reasonable."

This construction conforms to the judgment of reasonable men. The people of Wisconsin disclaim any intention of denying the railway companies just compensation; and their representatives have repeatedly said, "Show us that the rates fixed by law are not reasonable, and we will make them just."

Taking the standard given, a difficulty arises in the varying circumstances of roads. No two are alike. Still many are sufficiently so to admit of tolerably fair comparison. It is decided that things are conveyed under "like circumstances" where the labor and expense are, in the opinion of the jury, the same. In the matter of transportation, its cost is a paramount consideration. If compelled to do business below cost, bankruptcy is merely a question of time. A knowledge of the cost is, therefore, absolutely necessary in order to fix reasonable rates. A tariff of rates that would be extortionate if charged upon the New York Central, might be no more than reasonable on the Colorado Central, where business is light and expenses are heavy. It is not presumed that an accurate computation of the cost of moving a ton of freight one mile can be made; nor that, if approximated, it would be reliable, for "the cost of moving freight varies under given circumstances, at least as much as the cost of raising crops." Nor will the precise cost of moving a ton of freight one mile be known until a railroad is built and operated exclusively for freight. Yet there are certain elements of cost contingent upon locality that are quite evident. When, for instance, it is shown that the Chicago & Northwestern and Milwaukee & St. Paul companies annually expend nearly two million dollars for fuel for locomotives, and that medium coal averages \$2 in Wisconsin, while the Pennsylvania Railroad pays only \$1 for the best quality, it is manifest that, in one important respect, the cost of transportation must be 100 per cent. higher in Wisconsin than in Pennsylvania. This comparison extends to Illinois, Indiana and Ohio roads that traverse coal districts, some of which average less than \$1.50 per ton. This difference becomes more striking in view of the fact that of the 60 odd per cent. which the operating expenses of the Northwestern and St. Paul railways bear to their earnings, the item of fuel constitutes 12 per cent.

Expenditures for track repairs and renewals are the leading items of expense. Supplies being largely drawn from the East, Western roads must pay in excess of Eastern roads the cost of carriage to the West.

Another element of cost is climatic. Southern and Eastern roads are rarely troubled on account of snow or frost; whereas, during a "severe spell," Wisconsin railways are blocked for days, traffic is suspended, and great losses are incurred.

As it does not appear that in the remaining items of expense the Wisconsin companies can effect any reduction compared with other roads, clearly the cost of railroad operations in that State is greater than that of roads more fortunately located. On what principle, then, should they be reduced to lower rates of fare and freight? The average rate on the several classes named in the present law is, for 150 miles, a slight fraction over two cents per ton per mile. The rate for 150 miles is taken because that is the average distance that each ton of freight is hauled upon the leading railways of Wisconsin. The rate named would be realized were an equal quantity of each class of freight carried. But the lower classes predominate. Lumber is the main article of shipment. For 150 miles it is taken at less than 1½ cents per ton per mile, and for 250 miles at less than 1½ cents per ton per mile. Hence the companies are compelled to do the major portion of their local business at less than 1½ cents per ton per mile!

In Connecticut, the railroads average 6½ cents per ton per mile; Maine, 4½ cents; Massachusetts, 4½ cents; seven Pennsylvania roads, 5 cents; twenty-three Ohio roads, 6½ cents, and New York roads, including the New York Central, 3½ cents per ton per mile.

In Europe the average rates per ton per mile are: in Belgium, 2½ cents; France, 3 cents; England, 3½ cents; Germany, 4 cents.

The contrasts presented are made still more startling by the fifth section of the Potter law, which treats the several roads as though they constituted one line. The result may be stated thus: A car-load of lumber is shipped at Junction City, destined for Madison. The distance is 122 miles—53 on the Wisconsin Valley 25 on the West Wisconsin and 74 on the Northwestern Railway. The car-load rate is \$23. If divided among the three roads in the order named in section four of the law, the

Wisconsin Valley would receive for hauling 11 53 miles..... \$14 50  
West Wisconsin " " " 25 " " " 2 50  
C. & N. W. " " " 74 " " " 6 00

Were the rate to be divided on a strictly pro rata basis, i. e., in proportion to the distance hauled on each line, the

Wisconsin Valley Railway would receive..... \$8 00  
West Wisconsin Railway " " " " " 3 80  
Chicago & Northwestern..... 11 20

The results would be still different were these roads allowed the local rates named in the Potter law. Then the

Wisconsin Valley Railway would receive..... \$14 50  
West Wisconsin Railway " " " " " 8 00  
Chicago & Northwestern..... 16 00

Dealers at Wisconsin Valley Junction would be charged \$14.50 for a car-load of lumber from Junction City, whereas, were the car destined beyond, the total rate as far as Elroy, 25 miles further south, would not reach \$12. In one case the Wisconsin Valley Railroad would receive \$14.50 for hauling a car 63 miles; in the other, for the same service, only \$8. Then, the West Wisconsin would receive only \$2.50 for the same service which,

if the shipment began and terminated on its road, would yield it \$8. Such inequalities, if perpetrated by a railway company, would not be tolerated.

Compared with other States, the lumber rate is unreasonably low. It scarcely averages 1½ cents per ton per mile. In New England, the roads having a heavy lumber traffic average from 3 to 4 cents per ton per mile; while in the West, the average on leading roads for 150 miles exceeds 3 cents per ton per mile. This adverse showing extends to rates on grain and flour.

Nor is the comparison of passenger rates more favorable. Connecticut averages 4½ cents per mile; Maine, 4 to 5 cents; 14 Pennsylvania roads average 3½ cents; Michigan, 3½ cents; Minnesota, 4 to 5 cents; while in the Upper Peninsula the rate is 5 cents, and in Colorado, 10 cents per mile.

Throughout England the average is 4 cents; while upon the best routes—from London to Brighton and London to Dover—the through rate exceeds 5 and 6 cents per mile. In France the average is 4½ to 5 cents, and in Austria 4 cents.

The low rates enforced in Wisconsin cannot be justified. No railroad in the State is in position to earn a dividend, while two only from their earnings meet current expenses and interest on bonds, and they are enabled to do so only on account of their operations in other States. Thus the people of Wisconsin receive cheap transportation at the expense of others. This is shown by applying the average Potter law rates to the entire freight movement of the Northwestern and St. Paul companies for their last reported fiscal years. The former would then have closed the year with a deficit of \$1,076,602.63; and the latter with a deficit of \$1,842,599.63.

Nor are the companies with whose rates comparisons have been made excessively remunerative. Massachusetts and Pennsylvania each fall below an average of 5 per cent. dividend; Maine and Connecticut average 3½ each; while in the West, Ohio does not average 3 per cent., and only two roads in Indiana, four in Illinois, and four leased lines in Iowa, pay any dividends whatever. Of the remainder, the majority are in the hands of receivers.

The question as to whether charges are unjust, depends not upon what price the company carries for others, but whether the charges in themselves are excessive or not. Complaints are often based on the mistaken belief that it always costs less to carry freight a short than a longer distance, whereas distance has little to do with the cost of carriage. Cars earn money only when they are in motion, and earn it as long as they are in motion, which fact enables companies to earn large net profits on long business at less than half the rate which is barely remunerative on short hauls. The expense of loading and handling freight is the same, whether it be destined 10 or 100 miles. In proportion as a road is enabled to compete for through business—even though taken at low rates—to that extent it is enabled the cheaper to do its local business.

Uniform rates are also unjust, because the cost of operations is not the same upon each road, or any two roads. During the year ending Dec. 31, 1874, the expenses per mile run varied on the Milwaukee & St. Paul Railroad, from \$1.17 on the La Crosse Division to \$1.42 on the Prairie du Chien Division and \$1.46 on the Northern Division. The same year, the average cost of transporting a ton of freight one mile in New York, varied from nine mills on the New York Central to ten cents on the New York, Boston & Montreal Railroad; and according to President Scott's last report, the cost varied from seven mills per ton per mile on their Pennsylvania main line to one cent and seven mills on their New Jersey lines.

The character of the road should be considered. For every grade of 20 feet to the mile, the work required to overcome it is equivalent to that expended on two miles of level road.

It is also essential to know the probable amount of freight to be carried. A large, regular business can be done cheaper than a small, occasional business. The Wisconsin companies have a comparatively small tonnage, yet they are now obliged to carry it at a lower rate than the Pennsylvania or the New York Central, one of which frequently has 120 trains a day, and the other 16 miles of freight trains daily. The transportation of such vast quantities enables those companies to earn larger net earnings per mile than are the gross earnings of any two Wisconsin lines.

Freight movement is largely in one direction. During 1874, the Milwaukee & St. Paul Railway hauled 1,251,234 tons eastward, and only 484,321 tons westward. The cars requisite to carry this difference of 766,913 tons were hauled westward empty—i. e., a double trip was necessary to secure freight for one trip. Yet the inequality of business demands as large equipment as though it were constant.

The highest courts concur in recognizing the conditional fairness of unequal rates. In a leading case it was held "that a company may charge different rates for transportation where the expenses thereof are different, and, as the expense of starting a train is the same for a long or short distance, this may fairly be taken into account and justify an inequality in the rates of carriage between different places."

An intimate knowledge of the varying conditions of each line is, therefore, necessary in order to prescribe reasonable rates. As stated by a select Committee of the British Parliament, "These are matters which require the knowledge, skill and experience of the managers themselves, and any attempt on the part of any Government Department to do it for them is impossible." The Railroad Commissioners of Maine, Massachusetts and Michigan have reached the same conclusion. For, as a rule, the men who manage railroads are credited with shrewdness, which consideration alone will impel them to develop their territory, because whatever conduces to its wealth augments the company's profits.

In Ohio nine distinct tariffs of rates have been prescribed, of which the State Railroad Commissioner, in his report for 1870, said they were "the most fruitful source of complaint."

Illinois, after several attempts to define what ought to be charged, devolved the task upon three Commissioners, who prepared one schedule for all roads in the State alike.

Iowa took the Illinois rates, reduced them ten per cent. and applied them to four trunk lines.

Minnesota, failing twice to establish fixed rates, re-enacted the common law.

Untaught by these failures, Wisconsin likewise disregarded the cautious action of other States.

In Massachusetts, the Commonwealth can assume control, only after a road has been in operation 20 years. "By paying therefor the amount of capital paid in, with a net profit thereon of 10 per cent. from the time of payment by the stockholders to the time of purchase."

In England, if, after 21 years, any new railway has made 10 per cent. for 3 years, Government may reduce the rates charged but shall guarantee the company 10 per cent. for the next 21 years.

New York has followed the English rule, by enacting that the rates of fare or freight shall not, without the consent of the corporation, be so reduced by the Legislature as to produce less than 10 per cent. per annum on the capital actually expended.

Maximum rates have been prescribed in Pennsylvania; yet the companies most restricted are allowed to charge an average of four cents per ton per mile.

In New Jersey, by general law, the roads are authorized to charge ten cents per ton per mile.

In Ohio, they are unlimited up to 30 miles, beyond which they are authorized to charge five cents per ton per mile.

The six leading railways of England are empowered to charge six cents per ton per mile. Of these rates, a Parliamentary committee said, "They are always fixed so high that it becomes, sooner or later, the interest of the companies to carry at lower rates."

By wear and tear, a railway will depreciate 10 per cent. yearly. To that extent companies that are able make renewals. To omit making these would be held criminal negligence. Yet, to make them requires large outlays. These the Potter law rates preclude. Thus, Wisconsin law operates to impoverish the roads, render them unsafe, then punish the companies for becoming so!

The result has alarmed capitalists. Wherever they meet, the baleful effects of the law are known and appreciated. Their impressions are conveyed to the State Department through its agents abroad. The Consul at Rotterdam, in the Netherlands, alluding to the Potter law, says it has "affected those securities in which the Dutch capitalists had invested enormous sums," that "for years to come, no investment of Dutch capital in United States railroad enterprises will be made;" and that "financiers agree in declaring that a revival of confidence in American railroad enterprises can only be expected when a radical change takes place in the different States." The Consul at Frankfurt, the central banking city of Europe, says, "the Germans believe they have been deceived and defrauded;" they find that "sovereign States deny and disregard their guarantees;" and, he adds, "the interest offered by European enterprises is equal to the usual rates of interest in the United States. Hereafter, this capital will find abundant use in its own country."

Were Wisconsin beyond the need of foreign credit she might possibly afford to repel it. But, with the northern part of the State unbroken, and her vast resources lying dormant, it would seem unwise to bar out the means necessary to develop them. Without credit the State cannot advance. Minnesota quickly retracted her restrictive law. Wisconsin could do likewise. Transportation is a commodity, and is sold as are other services. If its price can be fixed by law, so can that of other commodities furnished by associated capital.

The argument concludes: "The rates of fare and freight enforced by law in Wisconsin are indefensible. They are proven to be unreasonable. The railways are compelled to furnish transportation below cost. In view of which, Edmund Burke's utterance is pertinent and true to-day: 'Men have no right to what is not reasonable.'"

### The Hoosac Tunnel Line.

Gov. Rice, of Massachusetts, in his annual message, intimates that the State has spent money enough on the tunnel, and is decidedly of opinion that no more should be appropriated. He is opposed to State management and favors the plan of consolidating the Tunnel Line with the connecting roads to form a strong through line from Boston to the Hudson River under one management.

For some time past there has been much talk of loose and inefficient management, of an undue expenditure in the improvement of the State road, and of favoritism in contracts. The Springfield Republican, in a carefully prepared article, notes the present condition of the work and refers to the matters spoken of at length, and from it we make the following extracts:

"The State has spent, and not too wisely it would seem, \$3,100,000 on the Tunnel Line since the completion of the Shandy contract. At the same time with this revelation of management, the Republican also brings to light what is claimed by railroad men of experience to be a point of grave defect in the tunnel itself, even going far to reduce largely or utterly the advantage of this route over the Boston & Albany line. It is found that, owing to ill-judged grade and defective ventilation—the smoke and soot settling and greasing the rails—considerably more bulk can be drawn to than through the mountain, with the same power, probably necessitating, in the end, the doubling of engines, duplicating, more or less fully, the Boston & Albany Washington Mountain disadvantage. The authorities of the road promise that it shall be ready for use before the close of the centennial year, and also give warning that they may ask for \$100,000 more to make it ready for the double tracks.

Whatever may be thought of their elaborate expense, there can be but one opinion of the way in which the tunnel line railroad contracts are being carried out. It is the most magnificent railroad building in the United States, with cattle guards and culverts on all the 40 miles outside of the tunnel of delicately dressed stone, and a job of costly rock and earth cutting at Bardwell's Ferry of rare magnitude. This last bids fair to block the calculation of the management that the entire line will be completed by Nov. 1; and one expert reckons that it will run into 77 at the present rate of 1,000 cubic yards of rock per month. From the Vermont line to the little tunnel at North Adams, Edmund Rice contractor, the graduation and masonry are nearly done, over four miles of steel rails laid, and the whole can be completed by July 1; B. N. Farren will finish the enlargement of the little tunnel by May. Passing the mountain, from the eastern portal to Greenfield, 30 miles, 13 of steel laid and completed road are made. The eight miles to Charlestown, N. C. Munson, contractor, are ready save ballasting on a portion and a little masonry; the next nine miles to Shelburne Falls, for which also Mr. Munson is responsible, the grading is nearly completed, but there are seven miles of track to be railed and ballasted, with a little masonry to be done; thence five miles to Bardwell's Ferry, B. N. Farren, contractor, the grading is nearly completed except at the big cut, about four miles of ballasting and railing must be done, but a large proportion of the masonry is completed except the Bear River bridge and the western abutment of Bardwell's bridge; on the next and last eight miles to Greenfield the work has practically just been opened, but is being rapidly pushed—C. M. McClallan & Son are responsible for 3½ miles, and N. C. Munson for the remaining 4½. The sub-letting and details of the entire line we have already given.

"B. N. Farren is employing about 425 men in the tunnel in excavating and arching; 90 yards of rock are taken out per day, and from 45,000 to 50,000 brick are laid. The arches are 20 inches thick, with pilasters of brick outside once in six feet; 4,800 feet of his contract had been done by Dec. 1, and from 3,000 to 4,000 remained. Of this Chief Engineer Frost believes that less than half can be finished by July 1; but, if 'not too much interruption is made by the trains,' can be done by Oct. 1. The work in the tunnel, even in the old days of mining, was never more picturesque than now. The men are divided into two shifts working 11 hours each, are provided with more flaring lights, and their entrance into the murderous old cavern as the gangs are changed is a spectacle of surpassing brilliancy.

"The old question of the ventilation of the tunnel just now returns in a serious form. It is practically found that there never is current enough to clear the tunnel from end to end; not it is claimed by many, can there ever be, with the grade of 25 feet to the summit at the central shaft, which breaks the direct draft. With an east wind and the draft of the central shaft, half of the tunnel is comfortably aired, but the western part is stagnant, smoky and almost unbearably close. A few weeks ago, when a trial change in the explosive was had, the whole gang of men were made sick and taken out, and a speedy return was had to Prof. Mowbray's mica powder. The efficiency of the central shaft as a chimney is not entirely settled, and there are not wanting theorists who claim that it is a positive detriment—this, it will be remembered, being always the ground



taken by Mr. Walter Shanly, who has predicted that it must ultimately be closed. The shaft will have saved two years in the construction of the tunnel, anyhow, if that be anything in the history of this undertaking. The little village on the mountain-top at the central shaft, by the way, is deserted, a six-foot wall girds the top of the shaft, and the hole is boarded up, save an opening left for ventilation. For the full and final trial, the shaft should be entirely open, of course. The grade of the Hoosac Tunnel is unique, we believe, as descending from the central shaft to either portal, and the present Chief Engineer admits that the grade of 26 feet was made much steeper than is ordinarily necessary for the water to run off.

Briefly, facts are given that would seem to show great and inexcusable grants of favor and funds to Mr. B. N. Farren, present contractor in the Hoosac Tunnel. His first arching contract was found to be ineffective, and its terms not lived up to—perhaps a losing one; he was also behind in his two outside contracts; nevertheless, a second and more advantageous contract was entered into in private by which Mr. Farren got \$24.55 for rock excavations per cubic yard to \$10 under the public contract; \$14 for brick arching to \$11.50 before; and \$5.60 for packing to \$2.75. The contract was also made retroactive to the 1st of July, while he was given a bonus on work done before that date. He had possession of the tunnel, and claimed to be in a position to force matters; which it would seem that he did, despite the fact that he was behind on the outside work, which point private interest would have used as a counter weapon. Other contractors were ready to bid for the work, had they been given the opportunity. And as covering the extravagance of the line, it is a startling fact that, in the two years since we celebrated our Hoosac Tunnel as done, we have almost spent \$3,100,000 on it and the Troy & Greenfield Railroad, or only about a million and a half less than the Shanly contract.

Mr. Farren received his first arching contract Nov. 19, 1874, and was to begin upon it 30 days 'after getting possession

road bed, is hauling to-day, at a profit, coal in cars belonging to coal companies, for 8½ mills per mile per ton, or 8½ cents for a car-load of 10 tons per mile. Multiply this by the seven miles which Mr. Farren has to travel through the tunnel, and you will have 45½ cents, while Mr. Farren, who only owns the engine, gets \$1.50—which can scarcely be called cheap transportation. This toll is paid to Mr. Farren by the Fitchburg road, but the State, under its contract, should be getting this slight return on its \$20,000,000, more or less, invested."

There are also further charges as to the contracts for the outside work and as to the use of the tunnel workmen to carry local elections for members of the Legislature, and it is claimed that the State is paying far too much for the engineering and oversight of the work. It is probable that there will be a good deal of talk over the tunnel in the Legislature this winter but the result is not easy to foresee.

### Contributions.

#### Experience with the Wilson Valve.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Your article of Sept. 18\*, on "The size of Steam Ports for Locomotives," suggests that at the same time that subject, which is virtually the admission of steam to the cylinder, is examined, we should consider the use of steam in the cylinder, and the release of the same after having done its work. The last two are subjects of equal value with the first, as the more expansive use we get the greater the economy, and the better the release the less resistance to the return stroke of the

release of the steam as with a larger passage. If the common valve *chokes* and retards the return stroke of the piston, the same may be expected of the Allen. In the Wilson valve, we get at full travel an exhaust opening one-eighth greater than the steam opening, and before the piston has reached the end of its stroke; while in the common and Allen valves, the full opening is only reached at the end of the piston stroke.

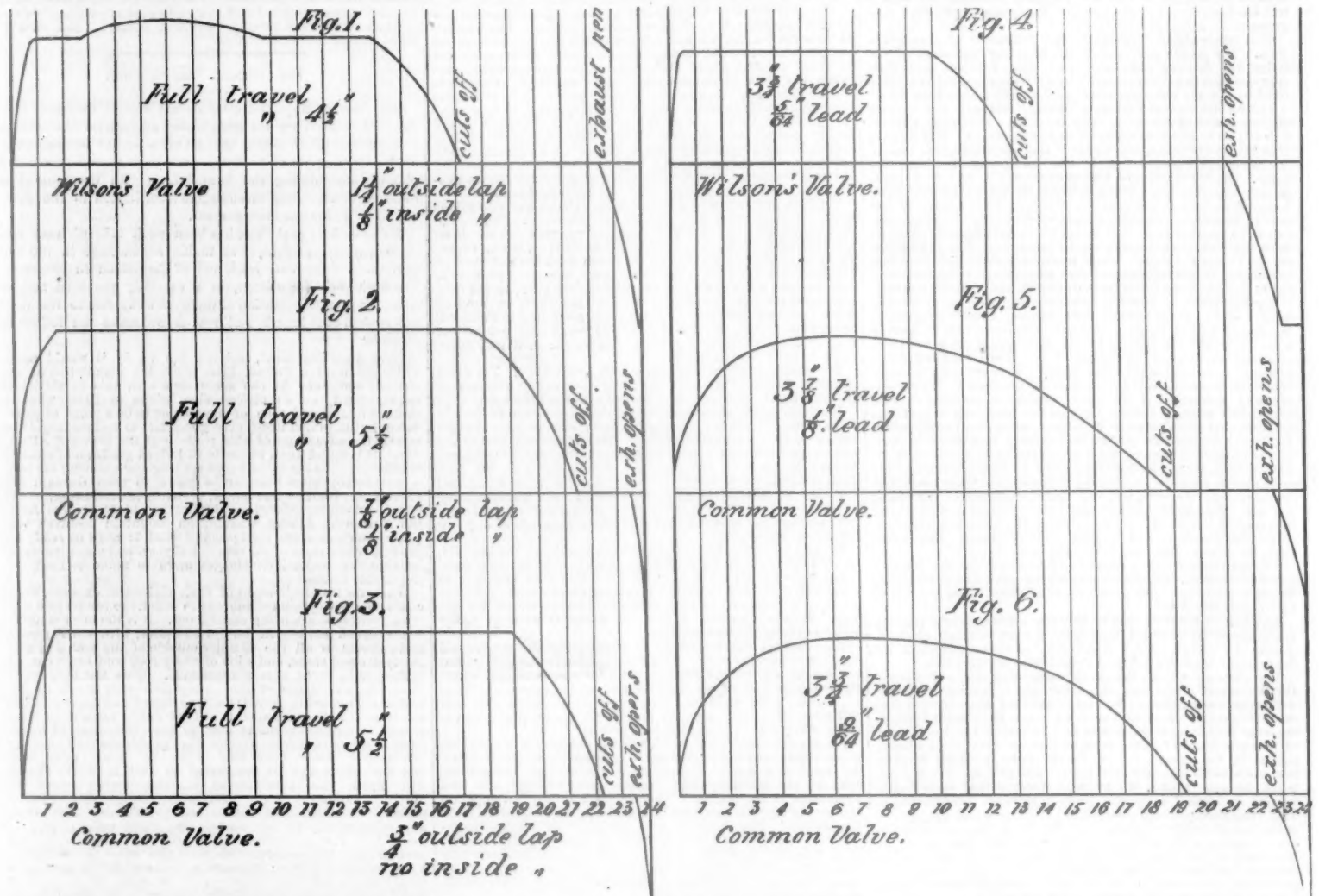
The diagrams which have been prepared are intended to show the relative width of openings of the Wilson and common valve, for the admission of steam, and for the exhaust. The horizontal scale is 3-16 in. to one inch, while the vertical scale is full size. We have taken 1½ inch steam ports and shown the common valve with both ¼ outside and ¼ inside lap and ¼ outside and no inside lap, while the Wilson valve has 1½ outside and ¼ inside lap. Three positions are shown, viz.: full throw; in notch of quadrant half way up to center, and in notch next the center.

The Wilson has a throw of eccentrics of 4¼ inches, while the common valve in both cases has a 5½ inch throw eccentric.

Fig. 1, shows the effect of the working of the Wilson valve at full throw. Fig. 4 shows same valve cut up to notch half way to center. Fig. 7 shows the same cut up to notch next center.

Figs. 2, 5 and 8 show the common valve with ¾ outside and ¼ inside lap in same notches, and Figs. 3, 6 and 9 show the common valve with ¾ outside and no inside lap at same points.

An examination shows that the Wilson valve at full throw, or the lowest notch, gets its steam quicker than the others,



of the tracks.' The State paid Messrs. Wells & Taylor \$1,500 for their track-laying contract, and gave the work to Mr. Farren that he might hasten it so as to begin his work immediately; and yet we find only 537 feet of rock excavation for arching done by the first of July following. The contract was for \$300,000, but the facts would seem to show that only about \$52,000 of it was performed up to July 1; and scarcely any work had been done before an order was passed by the council allowing Mr. Farren 4 yards, while his contract gave him but 2½ to the running foot; or, in other words, giving him \$40 where his contract allowed him but \$25. The second contract was made September, 1876, and the terms of the work were bettered in comparison with his first contract as above. This was to take effect the first of the previous July, and also gave to Mr. Farren \$7.50 per running foot for work done before that date—or added to his 'back pay' a \$9,397 gratuity.

To make still more clear the ground upon which the charge of extravagant favoritism is to be based, we present the advantage in the prices of labor in the tunnel possessed by Mr. Farren in '74 over the Shanlys in '68, amounting up to 25 per cent. In the materials used there is an advantage to Farren of 42 per cent.—the only item against him being about 15 per cent. in the cost of brick.

The Shanlys, who if anybody, would seem to have earned the consideration of the State, and the opportunity—if money was to be given away on the contracts—of retrieving their losses on their great contract to which they were so rigidly held, were competitors with Mr. Farren for the opportunity to arch the tunnel. They did the first arching, it will be remembered, and put in a bid of one price if no trains were run, another if the tunnel was used; Mr. Farren, however, expressly said that the operation of the tunnel would be no detriment to the work, and his first contract provided that trains should pass. To-day, he is allowed \$1.50 each on loaded freight cars, and 75 cents a head for passengers; at least 50 cars a day are said to pass, and 50 passengers, making \$112; putting the operating expenses at \$20, here is \$92 a day given away. The Erie Railroad, owning its

piston, and, of course, the less we *undo* the work we have done by free admission and expansive use.

The nearer we can approximate boiler pressure in our cylinder, the less wire drawing and the better the result. To this end we desire the largest possible opening in the quickest possible time. In your own language, "It is impossible to get too much steam into the cylinder during the period of admission."

You mentioned the Allen and Wilson valves as a step in the right direction. By their auxiliary steam ways they give early in the stroke double the opening for the inlet of steam that the common valve does; but beyond that they do not act alike, as the release of the Allen valve is like that of the common, while the Wilson, with its auxiliary exhaust ways gives an opening for the exhaust much greater and quicker than either of the others. If the ports of the common valve are lengthened above the length in general use, the gain is but little, as it is hardly practicable to get them much longer than the diameter of the cylinder; and even then the Allen or Wilson valve can be put on with equal advantage. If we increase the throw of the eccentrics, we lose in our expansive use of the steam, and do not gain in the opening for release. That opening at full travel of the valves is but two-thirds of the admission opening and we cannot expect as free

though the opening at its largest is but one inch, or a trifle less than theirs at their largest.

It cuts off sooner, viz.: at 17¼ inches, while the common valve cuts off at 21¼ and 22¼ respectively.

The release commences with the Wilson at 22 7-16 inches, and at 23 5-16 inches we have an opening as great as the largest in the other cases, and at 23¼ inches we have an opening 50 per cent. greater still, or 1¼ inches.

We have also worked steam expansively 53-16 inches. The common valves open the steam port to 1¼ inches, but open less quickly than the Wilson. They cut off at 21¼ inches (Fig. 2) and 22¼ inches (Fig. 3), and exhausts open at 23¼ inches, or within ¼ inch of the end of stroke of piston, having worked expansively but 2 inches and 1¼ inches. When the end of the stroke is reached, the exhaust port has opened ¼ inch, or but 66½ per cent. of the steam opening. The average opening for this piston movement of ¾ of an inch is less than ¾ inch. It is plain to see that the steam cannot have passed out, and that there must be some back pressure for the return stroke of piston. At the second position shown, the Wilson valve (Fig. 4) starts the stroke of piston with 5-64 lead, and our opening is 5-32. At ¾ inch piston stroke our valve is open 25-32 of an inch, which opening is held to 9¼ inch of stroke.

With the common valve the case is very different. We start with a lead of ¼ in. (Fig. 5) and 5-64 in. (Fig. 6), and at a piston movement of ¾ inch we have in first case an opening of 11-32 or 44 per cent. of the Wilson opening; and in the second, an opening of 17-32 in., or 68 per cent. The first (Fig. 5) reaches

\* The publication of the above communication has been delayed for some weeks owing to the crowded condition of our pages and also to the time occupied in having the engravings made. We reprint from the article referred to the engravings of the Wilson valve, which are numbered figs. 5 and 6, which must not be confused with the same numbers in the diagrams.

its largest opening of 1 1-16 in. at 6 3/4 inches of piston stroke, or over five inches behind the full opening of the Wilson; and the second (Fig. 6) reaches its largest opening of 1 1/2 in. at 7 inches of piston stroke, or nearly six inches behind the Wilson.

Now the Wilson cuts off at 13 3/4 inches of piston stroke; the common, at 19 and 19 1/2; the Wilson exhaust opens at 21 3/4 inches of piston stroke, and the common at 23 3/4 and 22 3/4; the Wilson having worked expansively 8 inches and the common 3 3/4 in. and 3 3/8 in., or about 48 and 35 per cent. of the distance of the Wilson.

The Wilson, then, has 2 3/4 inches piston movement in which to get rid of its steam, and at 23 3/4 inches has an opening of 1 1/2 inches, which it carries to the end of the stroke—1/4 inch further—this giving a free release. In the case of the common valve, the exhaust opens at 23 3/4 inches (Fig. 5) and 22 3/4 inches (Fig. 6), having 1 1/2 inches and 1 3/4 inches still for the piston to move, or about 41 and 50 per cent. of what the Wilson has. At 23 15-16 inches in the first case the opening is its largest, or 3/4 inch, or 67 per cent., of the Wilson, and 1-16 inch to move, or about 8 per cent. of the distance the Wilson has. In the second case the opening is its largest at 23 3/4, and is 1/4 inch, or 67 per cent., of the Wilson, with but 1/4 inch, or 17 per cent. of the Wilson distance, to go. It is evident that the release in both these cases is much inferior to that of the Wilson. The difference in the valves is most marked when cutting off early in the stroke, as shown in Figs. 7, 8 and 9 in first notch from center.

would be the same as the common valves); 4. e., like the Figs. 2, 5 and 8, if 1/4 in. inside lap was used; and like the next example if there was no inside lap.

These figures seem to indicate an improvement which only use can verify. The number of the Wilson valves put in use up to this time has been small, yet the results of practice are in the same direction as theory. One or two of them have been running four or five years; but until recently no record of fuel, etc., was kept with sufficient accuracy to be of any value, nor was the work done by these and other engines so divided that a comparison could be made.

In 1871 some tests were made on the Chicago, Burlington & Quincy Railroad between two engines of same build, same size, and exactly alike except that one had a Wilson valve 3 3/4 in. throw, one inch outside and 1/2 inside lap; while the other had a common valve 1/2 in. outside and 1/2 inside lap 5 in. travel. The result is shown below:

	Train miles.	Cars 1 mile.	Lbs. coal used.	Lbs. coal per mile.	Average No. cars in train.
Common valve.....	810	6,255	80,109	8.02	7.73
Wilson.....	810	6,090	37,195	6.16	7.44
Wilson valve. {more.....	....	....	....	....	....
less.....	....	235	12,974	1.86	0.28
Per cent.....	....	3.6	25.8	23.2	3.6

In the summer of 1874 two engines were selected upon the

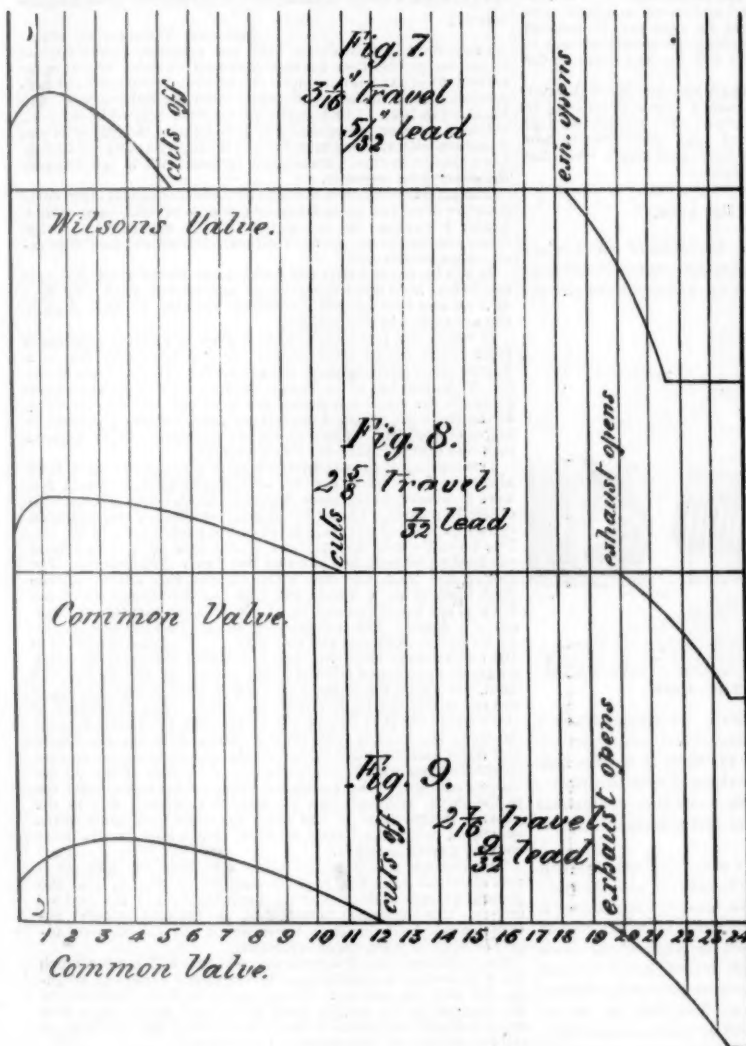
was many times made in two hours and 45 minutes, making five stops.

For four months, June to September inclusive, the showing is as follows:

	Train miles.	Cars hauled 1 mile.	Lbs. coal used.	Lbs. coal per car per mile.	Av. cars per train.
Common valve.....	13,875	115,573	945,500	8.18	8.34
Wilson valve.....	13,625	115,583	763,000	6.60	8.48
Wilson valve. {more.....	....	10	....	....	0.14
less.....	260	....	182,500	1.88	....
Per cent.....	1.8	0.001	19.3	19.3	1.7

The Wilson valve engine made one round trip less, but hauled very nearly the same number of cars one mile. The result seems very favorable for that valve, which probably had much to do with the saving. The engine with common valve had eccentrics 5 3/4 in. throw, 1/2 in. outside and no inside lap. The fuel used was Illinois coal, which is inferior to Pennsylvania or Ohio soft coal. These tests coincide with the deduction of a theoretical examination of the working of the valves. The one objection you raised (Sept. 14, 1874), that a special cylinder must be had, is true. In renewing or building new engines, however, this objection does not hold. It costs no more to cast a cylinder with a double exhaust port than with a single one, nor is there any extra cost in fitting. If the saving in fuel be one-half what is here shown, one year's use would pay for a considerable extra outlay. The experiment is well worth trying, and if further and more extended use corroborates the testimony of past experiences, the valve must grow in favor.

[It is difficult, we think, to make an accurate comparison of the theoretical advantages of the two valves from the above, because the points of cut-off are not the same in



SECTION OF WILSON'S SLIDE VALVE.

each case, and the compression lines or the points at which the exhaust closes are not shown. We have in preparation a series of diagrams representing an ordinary valve the Allen, Wilson and Gleason's valves, all with the same lap, lead and travel, which, we think, will show clearly the action of each. We do not doubt that the Wilson valve gives a much better distribution of steam than the ordinary valve, but it will be interesting to compare its action with that of the valves referred to, which were all illustrated in the Railroad Gazette of Nov. 14, 1874, page 445.—EDITOR RAILROAD GAZETTE.]

NOTE.—In the diagrams the vertical lines represent inches of stroke and are drawn to a scale of 3-16 in. = 1 in. The straight horizontal line may be called a datum line and be supposed to represent the edge of the steam-port. The curves above this line represent the motion of the valve, the vertical scale being full size. To explain this, we will take figure 1. It will be seen that at the beginning of the stroke (represented on the left side of the diagram) the edge of the valve corresponds with the edge of the port. Before the piston moves through the first inch of the stroke, the valve opens 1/4 in., as shown by the curve above the horizontal line. It then remains open that distance until the piston moves 2 1/4 in., when it begins to open a little wider, as indicated by the upward curve extending from that point to 3 1/4 in. of the stroke. The port then remains open 1/4 in. until the piston reaches 13 3/4 in. and then begins to close and steam is cut off at 17 1/4 in. It will thus be seen that the distance from the datum line of the motion curve above it at any point of the stroke, as indicated by the vertical lines, represents the width of the opening of the steam-port at that point. The form of the curve itself, however, indicates to the eye at a glance the opening of the port or the motion of the valve. The release of the steam or exhaust is shown in the same way by the curve below the datum line.

#### American Bonds in Switzerland.

ZURICH, Switzerland, Dec. 12, 1875.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your paper of Sept. 25, 1875, I noticed an article headed "American Railroad Bonds in Switzerland."

Allow me to say in contradiction that there are still a great many railroad bonds held here, besides Government bonds. Allow me further to say that it poorly behooves an American consul to blow into the general horn to decry railroad managers in the United States generally. It shows plainly that he

The Wilson valve starts the stroke with a lead of 5-32 and an opening of 5-16 inch. The largest opening is obtained at 1 1/2 inches of stroke and is 9-16 of an inch. The common valves start with 7-32 and 9-64 lead, representing an opening of same size. The largest openings are reached at 2 1/4 inches and 2 3/4 inches of stroke, and are 7-16 in. (Fig. 8) and 33-64 (Fig. 9), or but 78 and 92 per cent. of the Wilson opening.

The Wilson cuts off at 5 3/4 inches and the others at 11 and 12 3/4 inches.

The Wilson exhaust opens at 18 3/4 inches, the steam having worked expansively 12 3/4 inches. The others open exhaust at 19 3/4 and 19 1/2 in., working expansively 8 3/4 and 7 3/4 inches, or but 69 3/4 and 57 per cent. of the distance worked by the Wilson.

At 21 3/4 inches the Wilson has opened the exhaust to its largest extent—1 1/2 in.—which it maintains to the end of the stroke—2 3/4 in. The other valves reach their largest openings—1/4 in.—at 23 3/4 in. and 23 3/8 in. These openings are but 67 per cent. of the Wilson, and the distances of piston they are so maintained are 3/4 in. and 3/8 in., or but 14 and 19 per cent. of the Wilson distance.

At a speed of 30 miles per hour—not an unusual one for passenger trains between stations—a 68-inch driving-wheel makes about 150 revolutions per minute, the piston is 2-10 of a second in making its full stroke, and the speed of crank is one inch in 5-1,000 of a second.

When we consider this we see the value of the quick-opening ports both for steam and exhaust.

What has been said of the Wilson admission of steam will apply equally well to the Allen valve (but the Allen exhaust

same road to run over a 125-mile section, drawing their Atlantic and Pacific express trains, going once over the road each day, one going west the day the other went east.

The engine with the Wilson valve weighed 35 tons, of which 22 tons were on the drivers; cylinders, 16 x 24; driving-wheels, 63 inches; heating surface, 1,047 square feet. The other engine weighed 37 tons, of which 24 tons were on the drivers; cylinders, 16 x 24; driving-wheels, 68 inches; heating surface, 1,084 square feet. The maximum grades were 37 feet per mile each way, some of them very long.

They were not put on this run to see which would work the cheapest, but to make the time. During the last part of the year the showing was as follows:

	Train miles.	Cars 1 mile.	Lbs. coal used.	Lbs. coal per car per mile.	Av. cars per train.
Wilson valve.....	14,390	119,192	711,000	5.96	8.3
Common valve.....	15,000	95,727	786,000	8.21	7.3
Wilson valve. {more.....	1,290	23,455	....	....	1.00
less.....	....	....	75,000	2.25	....
Per cent.....	9.8	24	10.5	37	14

In 1875 another engine was got out with the Wilson valve, weight 36 tons; on drivers, 23 tons; 16 x 24 cylinders; 68-inch wheel; heating surface, 1,089 square feet; and put on same run in place of the 62-inch wheeled engine. The time was quickened over this section, and when the trains were received late, instructions were to make up the time, if possible. The run



has taken but little pains to ascertain the whole truth. I am not interested, either to white-wash guilty managers of railroad companies or government officers, but, on the contrary, I am one of the sufferers in two of your Western roads, and should therefore be more apt to side with the abusers. I know the trouble with all Western roads is nearly the same. Almost all of them were compelled to build under their charters before the country was settled. It was therefore wrong to expect an immediate payment of interest by those roads, and this, as appears from the investigations lately made into the affairs of roads unable to pay their coupons, was well understood by those banking houses and other agencies which undertook the placing of those loans and the negotiation of the bonds; and advantage of this fact was taken by them to force those bonds down. The public, which invested therein, frequently had them from 15 to 25 per cent. below their face, and other agents made about the same percentage. But such facts are not brought out by the press here before the reading public. Why not hold up to the light as well the actions of such, who had their profits in their pockets, before even dishonest railroad managers got hold of the money which was left? Do you know why nothing is said upon that point? Simply, it would not do to kill the goose which lays the golden eggs. It is simply ridiculous, nay, a falsehood, if those houses which placed those loans now say they were ignorant of such facts. They knew the interest on such loans could not be paid regularly, and in many cases they agreed to take care of them, as it would be far easier for them to make a new loan after such roads were built and running. I do not intend to shield any of your railroad managers who proved to be dishonest or even careless; but it is not fair to cry them all down, which is now done, not only by your consul, but by those here who made the most money out of such operations, done, I believe, simply for the purpose of hiding their own wrong-doings. I stated before that I am a sufferer; but the proceedings so far had with one of the roads I am interested in have clearly shown that the managers were honest, and that the blame was entirely to be placed at the door of the house or houses which placed the loans here in Europe. Therefore, justice to whom it belongs.

I am convinced, if it could be done (but it is impossible), that if the houses which negotiated the bonds of the suffering roads, those that were managed honestly, would return their ill-gotten percentage over and above 10 per cent., and the public pay in full for what they bought, nearly all those roads would be in a fair way and able to pay interest on their bonds. Since this cannot be done, those interested in roads that have been honestly managed should be satisfied if they receive the earnings of such roads honestly and say no more about it.

Excuse my liberty, but I wished to express to you that there are people here that judge for themselves and do not blow into the horn of your consul, but mean to be just and blame themselves as well as those that really deserve to be blamed.

A SUFFERER.

#### The Governor of Wisconsin Recommends the Repeal of the Potter Law.

In his inaugural address Jan. 13, Hon. Harrison Ludington, the new Governor of Wisconsin, spoke as follows of railroad legislation:

The present condition of the railway interests in the State, and the existing laws affecting that system, are earnestly recommended to the consideration of the Legislature. With the exception of the line from Portage to Stevens Point (a portion of the line to aid which the State received a land grant), which is now in process of construction, no railways are being built within the limits of the State. While the central and eastern portions of the State are well supplied with these facilities, the southwestern and northern portions are wholly without them. None of the companies owning or operating lines within the State have paid dividends to their stockholders for the past two years. The line from Milwaukee to Manitowoc, and thence to Appleton, has recently been sold under judicial proceedings growing out of a failure to pay interest on their first mortgage bonds, those citizens and municipal corporations of the State who had contributed largely to its construction losing their investment.

With the exception of the Chicago, Milwaukee & St. Paul, the Chicago & Northwestern, the Mineral Point, and the Western Union railroads, none of the companies have paid interest on their bonds during the past year, and during that year the existing laws restricting the companies in the amounts they shall charge and receive in compensation for services rendered have been enforced. The power of the Legislature to make and enforce these restrictions has been distinctly affirmed by the Supreme Court. Their decision is now under revision by the Supreme Court of the United States, and it is believed that the decision of our own Supreme Court will be affirmed. It will be admitted by all that this power is one of vital importance, requiring for its exercise great care and judgment.

It cannot be denied that the existing laws, passed in the exercise of this power, have, either justly or unjustly, impaired the credit of the State and of its individual citizens in the commercial and financial centers of the world. With immense resources undeveloped and a consequent need of capital from sources where it is in excess, the people find capital repelled by legislation which would seem to be so far in conflict with the rights of capital as to put the best interests of the people themselves at hazard.

That such legislation should have excited unfavorable comment is not strange. That capital has been invested in the building of railroads; that they are in daily use in the service of the people; that such use pays nothing to its owners; that the owners are compelled by law to permit such use, and are deprived by law of the right to say what they shall receive for it, are facts patent to all observers. It must not be forgotten, on the other hand, that it has been persistently charged that before this legislation was had the companies were extortionate in their charges, unjust in their discriminations, and arbitrary and oppressive in the exercise of their chartered powers; that the true interests of the people are promoted by these statutes, and that their continued existence is indispensable to the protection of their rights.

Can there be found a medium in legislation which shall fully protect the rights and interests of the people, and at the same time be just to capital? I believe that such may be found, and its importance will justify the earnest efforts of both the Legislature and Executive.

Certain fundamental principles must be kept constantly in view in preparing such legislation:

1. The rights of the people against corporations, as against all others, must be protected by efficient laws. No extortion, no unjust discriminations, no arbitrary acts of oppression must

be permitted. The remedy for such acts must be speedy, and the punishment sure.

2. It must also be remembered that such corporations are indispensable to the material prosperity of the State. It is not desirable that these great properties should be owned by the State. That corporations should continue to own and manage them seems a necessity. They must have the same protection from the laws that other citizens have.

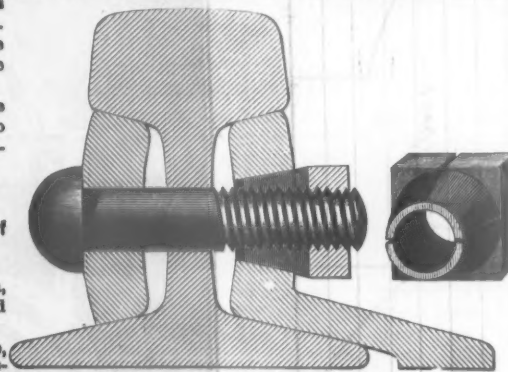
The State cannot afford to be unjust to any interest. Capital invested in railways must be equally protected with capital invested in any other legitimate business enterprise. While the State will not guaranty any return upon capital invested in any business, it should not, by legislation, so restrict its employment, or so limit its compensation, as to deprive it of the opportunity of earning a legitimate return upon the capital really invested.

With these principles in view, I respectfully recommend that the existing laws by which rates are regulated, known as chapter 273 of the laws of 1874, and chapter 334 of the laws of 1875, be repealed; that there be substituted for them carefully prepared provisions of law by which all unjust discriminations between either persons or localities, and all acts of oppression or wrong be prohibited, and ample provisions made for the prosecution and punishment of offenders as for crimes against the State; that extortionate rates be prevented by the establishment of maximum rates for the transportation of persons and property, not greater than those fixed by the companies when they made their own tariffs, and which may be presumed to be sufficient to enable them to earn a fair return upon capital actually and in good faith invested in them; that with that limitation, the companies be free to establish their own rates; that provisions be made for continued supervisory control over these corporations, similar in general terms to those which have been found satisfactory in Massachusetts and Minnesota; that annual reports be required from officers appointed by the State under official sanction, containing full information of all matters affecting the public interests, so that if at any time in the future a further and more stringent exercise of this reserved power should be necessary to prevent wrongs on the part of these corporations, all facts necessary to a full understanding of the subject will be accessible to the Legislature and the people.

In determining how the agency shall be constituted through which the State shall exercise its control over railroads, as in all other matters, economy is an object that should be kept steadily in view, and it is worthy of your consideration how this may be efficiently and vigorously performed, with the least expense to the people of the State.

#### Atwood's Conical Nut Lock.

It is difficult to know whether the inventors of car-couplers or of lock nuts are displaying the greatest amount of industry and ingenuity in inventing devices for accomplishing the re-



spective ends which they aim to achieve. So indefatigable are these two classes that railroad managers and newspaper editors soon learn caution in regarding the fruits of their prolific brains. At the risk of being overwhelmed with descriptive drawings and models of such devices, we venture to illustrate and describe a very ingenious form of lock nut which has recently come to our notice.

The engraving shows a section of a rail, fish-plates and bolt fastened with the nut referred to. The latter is also shown in a perspective view on the right. From these two engravings it will be seen that the under side of the nut is made of a conical form, fitting into the bolt hole, which is made of the same shape. From the perspective view of the nut it will be seen that the conical and also the upper or outer part of the nut are slotted, or, as it were, sawed apart, so that when the nut is screwed up into the conical hole, it will be compressed so as to clasp the bolt tightly, and thus be prevented from unscrewing. It does not matter whether the thread of the nut is cut so as to fit the bolt tightly or not, it will always be compressed when screwed up, so as to hold fast on the bolt.

The advantages claimed for this invention are that it is simpler than any other, as no additional piece is added to either the bolt or nut, that the nut has a longer bearing on the bolt, and consequently will not strip the thread, and therefore that the nut can be turned "home" sufficiently to make a more perfect joint than is possible with other nuts, especially those which rest on elastic bearings, and that wear only produces a more perfect fit of the bolt in its bearings.

The manufacturers of this nut also make a square nut of the usual form, made concave on its under side and slotted on top. When it is screwed down, the outside is contracted and thus pinches or clasps the bolt.

These nuts are applicable not only to fish-bolts but to cars, bridges and other kinds of work. The manufacturers are the Atwood Conical Lock Nut and Manufacturing Company, No. 40 Broadway, New York, who will be glad to give further information about it.

#### Railroad Manufactures.

During December the Edgar Thomson Steel Works were in operation only 18 days, on account of a broken roll and a scarcity of spiegeleisen. During that time the product was 1,479½ tons of steel rails.

The steel works of the Cambria Iron Company at Johnstown, Pa., produced, during the year 1875, 55,525 tons of Bessemer steel with two five-ton converters. The company is now putting the East Conemaugh furnace in order for making spiegeleisen, and it will probably go into blast in June.

The Shenango Rolling Mill at New Castle, Pa., shut down Dec. 26.

The Pittsburgh *Manufacturer* says: "A Centennial blow.—On the night turn, Dec. 31, 1875, and Jan. 1, 1876, there was blown at the Bethlehem Iron Company's Bessemer steel works, what is believed to be the largest heat of steel ever made in this country. This heat was the first in the new year, and weighed in steel ingots 18,550 pounds. This was blown in an ordinary five-and-a-half tons vessel; the blast pressure was 24 pounds, and the blow occupied 21 minutes."

The *Bulletin of the American Iron & Steel Association* says: "Wm. Clark & Co., of Pittsburgh, have recently made the experiment of fabricating hoop 'iron' from Bessemer steel rail ends, and with entire success. The hoops thus made are so tough that they may be bent back and forth an indefinite number of times without showing the least evidence of fracture. The rail ends were from the Edgar Thomson Steel Works."

The blast furnaces and rolling mills of the old National Iron Works at Danville, Pa., have been sold to John Roach, of Chester, Pa., the shipbuilder.

The Altoona (Pa.) *Star* of Jan. 15 says: "On Monday orders were received in the Pennsylvania Railroad shops for 15 more consolidation engines, to be finished at the earliest date possible. The men will work extra time on this new order four days in the week until further notice."

#### Experiments on Friction of Railroad Cars.

BY BENJAMIN H. LATROBE, C. E.

[The following report of Mr. Latrobe's experiments was originally published in the *American Railroad Journal* twenty years ago. It is little known to most engineers of this time, and has now an especial interest in view of the recent endeavors to secure a series of exhaustive experiments on train resistances.]

Baltimore, November 12, 1855.

DEAR SIR: In accordance with my promise, I now enclose to you for publication in the *Railroad Journal* the tabular statement of experiments upon the frictional resistances of railroad cars made under my direction upon the Baltimore & Ohio Railroad in 1844. I had expected to have visited New York within a week or two past and to have handed this paper to you in person with such explanations as it required; but not having been able to do this, I transmit it by mail with a few remarks illustrating its contents.

The primary object of the experiments was to test the comparative merits of three different patterns of coal cars, with 4, 6 and 8 wheels. In the course of the experiments, other classes of cars in use on the road were introduced and their resistances ascertained.

It will be noticed that the 4-wheel car shows much the least resistance, both upon the straight and curved road, and that of the 6 and 8-wheel cars the former appears to have slightly the advantage in this respect.

It would not, however, be safe to draw a general conclusion from these comparative results; as they are dependent in a degree upon circumstances not connected with the form of the car or the number of its wheels, such as the size of wheels and journals, the metal composing the bearings and its condition at the time, the pressure upon it per inch of surface, the sort of unguent used, &c. The number of experiments with 4-wheel cars was also too small for a safe average.

The making of the experiments upon a single car at a time also gave the 4-wheel car an advantage which it would not have possessed, in the same degree at least, when coupled with others in a train. I refer to the guiding effect of traction upon the single pair of wheels in front of the back wheels of the car. The 6 and 8-wheel cars, instead of one pair of wheels behind the leading wheels, had two and three pair respectively. The longer the train, and the more oblique the action of the draft upon it as a whole, the less the advantage which the 4-wheel car would possess in the particular mentioned, especially at speed. The resistance of the 6-wheel car was also reduced by the radiation and end play of the axles in several of the experiments with this car, a freedom of movement which certainly diminished friction in the curves at the slow speed used, but which would not be allowable in the ordinary use of the car at the usual speed upon the road. The resistance of the 8-wheel car in the curve was increased (and unduly in some cases) by the friction of its pivot bearings between the trucks and body, and the effect of this would appear to be more considerable than might be supposed, if we judge from the excessive addition to the resistance of the 8-wheel passenger car in the curve, although that was also, in a degree, due to the greater indirectness of the draft upon the back truck, when compared with the other 8-wheel cars whose trucks were coupled nearer together.

The averages stated in the table are those of each set of cars classified according to their number of wheels, and the general average is deduced from a combination of the first averages. It is important to note this, as different general averages would be deduced by throwing all the experiments together without previous classification.

The resistances per ton upon straight line will appear much lower in several instances than the standards generally adopted, of 8 to 10 lbs. per ton. There can be no doubt, however, of the accuracy of the results here given and which show how much a careful attention to the construction and working of railway machinery may improve its economy.

The particulars given in the table, when carefully examined and analyzed may be found of use to engineers in showing the effect upon the resistance to traction of all the various elements which go to make up its aggregate.

It will be seen that the "Babbitt's metal" or "composition" bearings gave the least friction; nevertheless the greater cheapness and durability of the "chilled cast-iron" bearings have led to their continued use upon the Baltimore & Ohio Railroad in preference to any other, and when worn to a smooth and polished surface they give results very nearly or quite as favorable as the "composition."

As regards the "unguent," it will be seen that the "grease" used gave, on the whole, results as favorable as the "oil"; and that the lowest friction observed was where the former was employed.

The "condition of the track" had necessarily its influence upon the experiments, as will be observed in connection with the note upon that subject. I regret that I cannot accompany the table with the notes of the relative elevation of the rails, which were taken at the time, but have been mislaid. The outer rail was, as well as I can recollect, about 8 inches above the inner when adjusted.

The results of these experiments may not be without value, as assisting to throw light upon the interesting and as yet somewhat obscure subject of resistance to railway trains in curves, but I am sensible of their imperfection as a standard for computing that resistance at the usual speeds, which so greatly exceed those of the experiments, and under the practical conditions of entire trains with locomotives at their heads. I have remarked with much satisfaction the highly commendable course of experiments for some time in progress with a view to these questions, upon the New York & Erie Railroad under the direction of the able Superintendent of that work, and I hope to see them shortly presented to the profession in a shape which will make them available for our use and guidance in the location and operation of our lines.

In offering the present paper for publication I feel that it should have been, by rights, made public property long since,



and I have no better excuse for the delay than that which every busy professional man can well make for me.

I am, Dear Sir,

Very respectfully yours,

REAR. H. LATROBE,  
Civil Engineer.

The experiments of April 30, from 1 to 6 inclusive, were made upon the straight new H rail track, about 1/4 mile from the west gate of the Mount Clare depot. The distance over which the cars were drawn was about 230 feet.

The experiments of May 1, 4, 9, 15, 18, from 7 to 36 inclusive, were made upon the straight and curved track (radius 400 feet) immediately west and east of the crossing of the Washington Branch road, at the north end of the Thomas viaduct. The greatest distance run over was 875 ft., of which 650 was west and 225 east of the crossing; 500 feet curve and 875 feet straight line.

#### REMARKS.

The amount of traction was ascertained by weights suspended in a scale dish weighing 40 pounds and hanging by a rope over a pulley placed upon the top of a frame, resting on a light 4-wheeled car, which was pushed by men before the car experimented on, which followed at a uniform velocity.

(a) In these six experiments the speed averaged about 1 1/2 miles an hour, the cars being set in motion at about that speed, just before reaching the points from which the distances were measured. There is a descent eastward in the track of about one-sixth of a foot in the 230 feet on which the cars were run, which made it necessary to run the cars both ways in order to get the average tractive force required to overcome friction apart from gravitation.

(b) The speed in these six experiments averaged about 2 1/2 miles per hour. In a few cases the cars were run in both directions, where the wind was so strong as to make that proper. The track, however, being level between the ends of the run, the rest were moved in one direction only (eastward) while trying the traction. The track on the curve for about 150 feet east of its western end was in bad adjustment, being too low on the outer rail. This was readjusted between the 9th and 15th of May, and was in good order during the remaining experiments from the 26th to 35th inclusive.

(c) The speed in these and the succeeding experiments up to the 25th averaged about 3 1/2 miles per hour; up to the 18th experiment the cars were pushed only as far as the monument at the west side of the Washington railroad crossing. From the 19th to the 25th experiment they were pushed as far as they would go beyond the crossing, the shock of which checked their momentum so as to bring them up about 80 or 90 feet east of the crossing.

(d) The axles suffered to vibrate, the bearing boxes of the journals moving to and fro on the pin supporting the spring bars.

NOTE.—When examined on the curve the axle stood thus:

Inside.		Outside.	
Hinder end	3.505	3.405	Fore end
diff.	.092	.095	
	3.597	3.440	

so that the inner journals were closer together than the outer by an average of 0.0835 of a foot or 3/8th of an inch.

This journal was a little back of the proper position of the axle, normal to the curve.

(e) The extreme axles fixed parallel by wedges in the jaws holding the ends of the vertical spring bars.

NOTE.—The extreme axles (7 feet apart) were in this experiment brought to parallel positions and kept so by wedges driven in between the jaws of the bearing boxes and under the vertical spring bars, so as to make those bars bear upon the top of the boxes instead of upon the horizontal pins through the jaws, on which as a center of motion the boxes had been suffered to move backwards and forwards, as far as they could without coming up against the bottom of the spring bars.

(f) The bolster pivot bearings of this car were greased with tallow just before leaving the Mount Clare depot.

(g) The bolster pivot bearings of this car were greased with oil just before making the experiment.

(h) From the 26th to the 35th experiments the cars were pushed quite through the curve at a speed of from 2 to 3 miles per hour.

(i) From the 26th to the 35th experiments the grease used in the experiments is a compound of tallow, soda and water.

(k) All the axles free to vibrate under the bearings. Forward outer wheels hung back quite through the curve.

NOTE.—The positions of the axles on the curve were thus:

Inside.		Outside.	
Hinder	3.413	3.500	Fore.
diff.	.087	.086	
	3.496	3.586	

Inner journals nearer than outer by av. of .069 ft. or 13-16th inch +.

(l) Extreme axles fixed on inside of curve.

(m) Extreme axles fixed on both sides, but middle axles not wedged. When car stopped on curve forward outer flange hard against rail, hind outer flange 1/4 inch off.

(n) This car had run over the road from Cumberland to Baltimore the day before the experiment.

(o) All axles free. The total end play of the axles = 1 1/2 inches. The flanges 4 feet 7 1/2 inches apart from outside to outside of flanges, next the rail.

(p) Extreme axles fixed on outside of curve. In this experiment the forward outer wheel was thrown back by the shock of crossing the Washington Railroad and did not regain its position. The speed of the car was thus so far checked that it stopped in 150 ft. from the crossing, and the tractive power was set down at what it was on the 1st of May.

NOTE.—The positions of the axles on the curve were thus:

Inside.		Outside.	
Hinder	3.400	3.525	Fore
diff.	.082	.085	
	3.482	3.580	

Average difference in nearness of journals, .038 feet 13-16th + of an inch.

(r) Extreme axles fixed on both sides of the curve.

(s) Extreme axles fixed on both sides of the curve and middle axles also wedged, tight and parallel.

(t) The bolster pivots of this car had been altered since the last experiment, by introducing cast plates with ball and socket joint.

(u) To trim the car 4 tons of iron were put into the bottom and it was then loaded to the top of the cone with coal.

NOTE.—The 36th experiment was made with the 4-wheeled coal car of R. Winans fitted up with chilled bearings, 6 x 2 1/2, but the traction was so heavy (9 lbs. per ton being insufficient

upon a straight line), that the experiment was not persisted in, and the journal being examined by removing one of the boxes, the soft iron of which they consisted was found to be considerably cut by the chilled bearing, thus accounting for the increased friction. The bearings had been ground smooth with emery, but nevertheless operated so injuriously on the soft iron of the axles as to show the necessity of always case-hardening the journals when used with this kind of bearing.

NOTE.—The 8-wheeled coal car of R. Winans made a trip to Cumberland and back between the last two experiments, and it was stated that her journals were somewhat cut by the bearings, in consequence of dust getting into the boxes; nevertheless it will be seen that this car showed less friction, her load considered and the pressure per square inch on her bearings, than on either of the previous experiments.

At the Mount Clare Depot the 8-wheeled coal car of J. Murray was drawn through a curve at the west end of the coal

bins, said to be of 75 ft. radius and the axles being free to vibrate took this position:

Inside.		Fore.	
Hinder	3.385	3.438	
diff.	.053	.060	
	3.438	3.498	

#### Outside.

thus the outer fore wheel was forced back so as to make it nearer the middle wheel by .060 ft. or 3/4 inch than the inner fore wheel was to the middle wheel.

NOTE.—The pivot bearings of the truck bolsters were of wrought iron in R. Winans' 8-wheeled coal car.

The pivot bearings of the truck bolsters were of chilled cast iron in the oldest 8-wheeled house cars; and of soft cast iron in the newest 8-wheeled house cars.

### TABULAR STATEMENT OF THE PARTICULARS OF EXPERIMENTS MADE UPON THE BALTIMORE & OHIO RAILROAD IN THE MONTHS OF APRIL AND MAY, 1864.

With a view to determine the FORCE OF TRACTION required to draw certain cars of different models over the straight and curved parts of that road.

No. of Experiment.	DATE OF EXPERIMENT.	DESCRIPTION OF CAR EXPERIMENTED UPON.	WEIGHTS IN TONS OF 2,240 LBS.		TRACTION IN LBS.				AXLE BEARINGS.	Sort of Metal composing Bearings.	Kind of ungutted used.	Diameter of Wheels.	Distance of Axles apart from each other.	Distance of Trucks from Center to Center.	AGE OF CAR IN YEARS.	STATE OF THE WIND.	Direction.	Force.	Increase of resistance due to the curve.	Resistance on straight line.	In lbs. per ton.	Pressure on the Journals.	Pressure on the Rails through each wheel.	Ratios of Weight of Car to Weight of Load.	Diameter of Journal to Diameter of Wheel.
			Weight of Car.	Weight of Load of Coal, etc.	Upon the Straight Line.	Upon the curve of 400 ft. rad.	Traction westward.	Traction eastward.																	
1	1884	Eight-wheel house car.	4.52	5.76	10.98	11.44	125	116	2 1/2	Cel	O	31	3	5	16	7	abeam	moderate	1.82	1.08	1.50	439	1.92	10-125	94
2	April 30	do.	4.18	4.48	8.66	9.81	80	80	2 1/2	Cel	O	31	3	5	16	7	abeam	brisk and uns.	1.57	1.08	1.50	387	1.57	do.	1.07
3	"	Six-wheel coal car, J. Murray.	2.09	2.56	9.38	10.71	107	103	3	Cel	O	31	3	6	7 1/2	q. new	on quarter w.	1.50	1.08	1.50	515	1.50	do.	2.64	
4	"	do. old pattern.	2.72	3.44	5.13	5.71	34	25	3	Cel	G	31	4	3	10	1	from w. quarter	strong.	1.54	1.08	1.50	310	1.54	10-134	2.49
5	"	Four-wheel coal car, R. Wynans.	2.72	3.44	5.13	5.71	34	25	3	Cel	G	31	4	3	10	1	from w. quarter	strong.	1.54	1.08	1.50	310	1.54	10-134	2.49
6	"	Eight-wheel coal car, do. as No. 2.	2.72	3.44	5.13	5.71	34	25	3	Cel	G	31	4	3	10	1	from w. quarter	strong.	1.54	1.08	1.50	310	1.54	10-134	2.49
7	May 1	Eight-wheel house car, same as No. 1.	4.18	4.48	8.66	9.81	80	80	2 1/2	Cel	O	31	3	5	16	7	abeam	brisk	1.54	1.08	1.50	349	1.54	10-134	2.49
8	"	do. same as No. 1.	4.18	4.48	8.66	9.81	80	80	2 1/2	Cel	O	31	3	5	16	7	abeam	brisk	1.54	1.08	1.50	349	1.54	10-134	2.49
9	"	Six-wheel coal car, same as No. 3.	2.09	2.56	9.38	10.71	107	103	3	Cel	O	31	3	6	7 1/2	q. new	on quarter w.	1.50	1.08	1.50	515	1.50	do.	2.64	
10	"	Four-wheel coal car, R. W., same as No. 5.	2.72	3.44	5.13	5.71	34	25	3	Cel	G	31	4	3	10	1	from w. quarter	strong.	1.54	1.08	1.50	310	1.54	10-134	2.49
11	"	Eight-wheel coal car, R. W., same as No. 6.	2.72	3.44	5.13	5.71	34	25	3	Cel	G	31	4	3	10	1	from w. quarter	strong.	1.54	1.08	1.50	310	1.54	10-134	2.49
12	May 4	Four-wheel coal car, J. M., same as No. 8 and 10.	1.10	1.15	2.38	2.63	13	13	3	Cel	G	31	3	6	7	1	west quarter	brisk	1.57	1.08	1.50	474	1.57	10-171	1.59
13	"	Eight-wheel box car, J. M., same as No. 8 and 10.	2.09	2.56	9.38	10.71	107	103	3	Cel	O	31	3	6	7 1/2	q. new	on quarter w.	1.50	1.08	1.50	515	1.50	do.	2.64	
14	"	Six-wheel coal car, J. M., same as No. 8 and 10.	2.09	2.56	9.38	10.71	107	103	3	Cel	O	31	3	6	7 1/2	q. new	on quarter w.	1.50	1.08	1.50	515	1.50	do.	2.64	
15	"	Eight-wheel coal car, R. W., same as No. 8 and 10.	2.09	2.56	9.38	10.71	107	103	3	Cel	O	31	3	6	7 1/2	q. new	on quarter w.	1.50	1.08	1.50	515	1.50	do.	2.64	
16	"	Eight-wheel house car, No. 27.	4.73	4.64	9.87	9.87	60	60	2 1/2	Cel	O	31	3	5	16	7	abeam	brisk	1.57	1.08	1.50	474	1.57	10-171	1.59
17	"	do. No. 28.	4.73	4.64	9.87	9.87	60	60	2 1/2	Cel	O	31	3	5	16	7	abeam	brisk	1.57	1.08	1.50	474	1.57	10-171	1.59
18	"	Eight-wheel house car, No. 28.	4.73	4.64	9.87	9.87	60	60	2 1/2	Cel	O	31	3	5	16	7	abeam	brisk	1.57	1.08	1.50	474	1.57	10-171	1.59
19	May 9	Six-wheel coal car, J. M., same as No. 3.	2.09	2.56	9.38	10.71	107	103	3	Cel	O	31	3	6	7 1/2	q. new	on quarter w.	1.50	1.08	1.50	515	1.50	do.	2.64	
20	"	do. do.	2.09	2.56	9.38	10.71	107	103	3	Cel	O	31	3	6	7 1/2	q. new	on quarter w.	1.50	1.08	1.50	515	1.50	do.	2.64	
21	"	Eight-wheel house car, No. 468 A.	4.78	4.37	9.15	8.99	60	60	2 1/2	Cel	O	31	3	5	16	7	abeam	brisk	1.57	1.08	1.50	474	1.57	10-171	1.59
22	"	Eight-wheel house car, No. 468 A.	4.78	4.37	9.15	8.99	60	60	2 1/2	Cel	O	31	3	5	16	7	abeam	brisk	1.57	1.08	1.50	474	1.57	10-171	1.59
23	"	Eight-wheel coal car, R. W., same as Nos 6 and 13.	2.72	3.44	5.13	5.71	34	25	3	Cel	G	31	4	3	10	1	from w. quarter	strong.	1.54	1.08	1.50	310	1.54	10-134	2.49
24	"	Six-wheel coal car, J. M., same as No. 3.	2.09	2.56	9.38	10.71	107	103	3	Cel	O	31	3	6	7 1/2	q. new	on quarter w.	1.50	1.08	1.50	515	1.50	do.	2.64	
25	"	Eight-wheel coal car, J. M., same as No. 3.	2.09	2.56	9.38	10.71	107	103	3	Cel	O	31	3	6	7 1/2	q. new	on quarter w.	1.50	1.08	1.50	515	1.50	do.	2.64	
26	May 15	Six-wheel coal car, R. W., same as No. 6.	2.72	3.44	5.13	5.71	34	25	3	Cel	G	31	4	3	10	1	from w. quarter	strong.	1.54	1.08	1.50	310	1.54	10-134	2.49
27	"	do. do.	2.72	3.44	5.13	5.71	34	25	3	Cel	G	31	4	3	10	1	from w. quarter	strong.	1.54	1.08	1.50	310	1.54	10-134	2.49
28	"	do. do.	2.72	3.44	5.13	5.71	34	25	3	Cel	G	31	4	3	10	1	from w. quarter	strong.	1.54	1.08	1.50	310	1.54	10-134	2.49
29	"	Eight-wheel passenger car.	7.90	6.81	13.91	12.65	65	65	2 1/2	Cel	O	31	3	5	16	7	abeam	brisk	1.57	1.08	1.50	474	1.57	10-171	1.59
30	"	do. do.	7.90	6.81	13.91	12.65	65	65	2 1/2	Cel	O	31	3	5	16	7	abeam	brisk	1.57	1.08	1.50	474	1.57	10-171	1.59
31	May 18	Six-wheel coal car, J. M.	2.48	2.48	4.40	4.40	38	38	3	Cel	G	30	3	6	7	1	west	strong	1.48	1.48	1.48	257	1.48	10-133	2.89
32	"	do. do.	2.48	2.48	4.40	4.40	38	38	3	Cel	G	30	3	6	7	1	west	strong	1.48	1.48	1.48	257	1.48	10-133	2.89
33	"	do. do.	2.48	2.48	4.40	4.40	38	38	3	Cel	G	30	3	6	7	1	west	strong	1.48	1.48	1.48	257	1.48	10-133	2.89
34	"	do. do.	2.48	2.48	4.40	4.40	38	38	3	Cel	G	30	3	6	7	1	west	strong	1.48	1.48	1.48	257	1.48	10-133	2.89
35	"	do. do.	2.48	2.48	4.40	4.40	38	38	3	Cel	G	30	3	6	7	1	west	strong	1.48	1.48	1.48	257	1.48	10-133	2.89
36	"	Eight-wheel coal car, R. W. same as No. 3.	2.72	3.44	5.13	5.71	34	25	3	Cel	G	31	4	3	10	1	from w. quarter	strong.	1.54	1.08	1.50	310	1.54	10-134	2.49
		Four-wheel	1.74	1.74	3.86	3.86	44	44	3	Cel	G	30	3	6	7	1	west	strong	1.38	1.38	1.38	237	1.38	10-133	2.89

\* Explanation of Abbreviations used in the above Table.—Cel means Chilled cast Iron; Bm, Babbitt Metal; G, Grease; O, Oil; sw, extreme wheel; q, quills; uns, unste dy; c, eastward; w, westward; mod., moderate; cm., calm; sk., strong; br., brisk; ab., abeam.—The letters in the last column after the items to each experiment, refer to the remarks on another page.

AVERAGE OF THE EXPERIMENTS on the different descriptions of Car—four, six and eight wheeled—for each sort of Car.

	4-wheel cars.	6-wheel cars.	8-wheel cars.
Four-wheel coal car, R. W. number of experiments.	31	74	4.76
do.	1.20	1.75	6.49
do.	1.20	1.75	6.49
Six-wheel coal car, J. M., with chilled bearings, do.	4.82	4.94	5.24
do.	1.21	1.76	6.49
Six-wheel coal car, J. M., with Bm. bearings, do.	4.82	4.94	5.24
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do.	1.21	1.76	6.49
Six-wheel coal car, J. M., with Bm. bearings, do.	4.82	4.94	5.24
do.	1.21		





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## Editorial Announcements.

**Passes.**—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

**Advertisements.**—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns our own opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

**Contributions.**—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

## TRAIN ACCIDENTS IN 1875.

With the report for December we complete this week our record of train accidents for the year 1875, the third complete year for which we have made reports. For 1875 the record is, perhaps, a little more complete than for the previous year, owing to somewhat better facilities, but completeness is hardly a proper word to be used in connection with it. As we have often said, and as is especially proper to repeat in this summary for the year, our record is made chiefly from newspaper reports of accidents, a very large number, from all parts of the country, being searched weekly for this purpose among others, though correspondents add to this news somewhat. The result is that most of those accidents which are not mentioned in the newspapers find no place in our record. In fact, accidents causing death or any noticeable injury to any person, are usually reported in the newspapers; but a large number of accidents, especially of those happening to freight trains, which do no injury to persons, are never heard of by the public, unless some considerable delay to passenger trains or great destruction of property is caused thereby. This is especially the case with breakages of locomotives and freight cars, so that our record is probably especially deficient in these particulars, though such as cause fatalities cannot often escape us.

For three years our record of the number of accidents, of killed and injured is as follows:

	1875.	1874.	1873.
No. of accidents.....	1,201	980	1,283
No. killed.....	428	286	464
No. injured.....	1,107	778	1,176

Last year, therefore, is a mean between the two preceding in the number of the accidents, the killed and the injured. The accidents have been all along somewhat proportional to the severity of the winters. We had a terrible winter in 1873, and we had an unequal number of accidents; in 1874 the winter was mild, and accidents were few; in 1875 we had a severe winter again, and with it a large number of accidents. To illustrate this we give the number of accidents during the first quarter of each year compared with the total:

	1873.	1874.	1875.
No. of accidents in entire year.....	1,283	980	1,201
No. in first quarter of the year.....	428	286	428
Percentage in first quarter.....	33	29	36
Accidents per day, entire year.....	3.51	2.68	3.29
Accidents per day, first quarter.....	4.70	3.18	5.16

The proportion, it seems, has always been larger in the winter, but while 29 per cent. of the accidents were in 25 per cent. of the time in the mild winter of 1874, 33 and 39 per cent. of the larger totals occurred in the same time in the severe winters of 1873 and 1875.

The classification of the accidents of each year according to their nature or causes gives the following results:

COLLISIONS:	1875.	1874.	1873.
Rear.....	141	131	187
Butting.....	104	87	102
Crossing.....	18	19	31
Unknown.....	15	29	72

DERAILMENTS:	1875.	1874.	1873.
Unexplained.....	222	218	315
Broken rail.....	107	42	111
Misplaced switch.....	81	67	72
Cattle on track.....	51	45	54
Wash-out.....	44	10	30
Loose or spread rails.....	40	18	13
Broken axle.....	39	20	21
Accidental obstruction.....	37	51	44
Snow or ice on track.....	36	13	9
Broken wheel.....	35	20	26
Broken bridge or trestle.....	26	33	19
Malicious obstruction.....	21	23	11
Broken truck.....	15	8	7
Broken or defective switch.....	15	12	10
Land-slide.....	11	..	..
Broken or defective joint.....	10	6	3
Broken or defective frog.....	8	8	4
Wind.....	7	..	..
Rail removed or displaced.....	6	7	16
Broken parallel or connecting-rod.....	5	..	..
In making flying switch.....	4	..	..
Failure of coupling or draw-bar.....	3	7	6
Broken car.....	3	..	..
Runaway engine.....	3	1	6
Running through siding.....	3	3	3
Loose wheel.....	2	4	2
Open draw-bridge.....	2	6	4
Bad track.....	2	13	7
Fall of brake or brake-beam.....	..	3	9
Careless stopping or starting.....	..	3	..
Overloading car.....	..	2	..
Bad switching.....	..	2	..
Running over man.....	..	2	..
Flood over track.....	..	2	..
Others (one each).....	3	11	7

## ACCIDENTS WITHOUT COLLISION OR DERAILMENT:

	1875.	1874.	1873.
Boiler and cylinder explosions.....	29	18	19
Broken parallel or connecting-rod.....	14	8	11
Broken axle.....	13	..	..
Cars burned while running.....	10	16	3
Broken tire.....	9	..	..
Broken crank-pin.....	2	..	..
Flue collapsed.....	1	..	..
Other breakage of rolling stock.....	5	10	19
Steam-chest explosion.....	..	2	..
Flue plug blown out.....	..	2	..
Failure of bridge or trestle.....	..	2	..
Mass falling on running train.....	..	2	..
Accidental obstruction.....	..	11	..
Malicious obstruction.....	..	3	..
Unknown.....	..	2	9

Totals.....1,201 980 1,283

## RECAPITULATION.

	1875.	1874.	1873.
Collisions.....	278	260	392
Derailments.....	640	654	815
Other accidents.....	83	66	76
Totals.....	1,201	980	1,283
Average number per day.....	3.29	2.68	3.51

The record for last year resembles that for 1873 in many respects, that year affording a very unfavorable exhibit. Matters seemed somewhat amended in 1874, but with the recurrence of severe weather there has been a relapse in the way of accidents. Even more butting collisions are reported for last year than of 1873, but in the latter year so many were characterized simply as collisions, without information as to their character, that this cannot be taken as proof of increasing depravity in working the railroads. The whole number of collisions is but 7 per cent. greater than in 1874, the whole number of accidents being 22 per cent. greater; and there were 30 per cent. fewer collisions than in 1873, so that this peculiar sin in the running of trains on the whole seems tending to decline, though probably the less crowded condition of the roads in later years had more to do with the decrease than any great improvement in the character of train-men and the skill of their officers.

The number of broken rails seems to be a pretty good index to the temperature of the winters. Thus for the cold years 1873 and 1875 we have 111 and 107 derailments assigned to this cause; for the mild year 1874, but 42. This is further shown by a comparison of accidents from this cause occurring in the first and the third quarters of each year, as follows:

Accidents caused by Broken Rails in the quarter including January, February and March, and that including July, August and September for Three Years:

	1873.	1874.	1875.	Total.
First Quarter.....	65	30	90	175
Third Quarter.....	5	8	3	13

Thus there are reported about fourteen times as many derailments caused by broken rails in January, February and March of the three years as in July, August and September.

For 618 of the derailments in 1875, 436 in 1874, and 500 in 1873, causes are assigned. Broken rails caused 22 per cent. of these derailments in 1873, 10 per cent. in 1874, and 17 per cent. in 1875. Misplaced switches are charged with 14½ per cent., 15½ per cent. and 13 per cent. in the three years in their order. A more general classification of causes of derailments gives the following:

	1873.	1874.	1875.
From defects or failures in permanent way.....	200	146	261
From defects or failures in rolling stock.....	73	63	101
From negligence or carelessness or malice.....	96	107	114
Unforeseen obstructions not malicious.....	111	109	143

While there was no accident conspicuous for its fatal effects, like the Lemont and Revere collisions of former years, the average of fatalities has been about as great as for the two previous years. The average number killed and injured per accident has been:

	1873.	1874.	1875.
Killed.....	0.315	0.209	0.196
Injured.....	0.914	0.900	0.923
Killed and injured.....	1.129	1.008	1.118

The tendency of improvements in railroad equipment and apparatus in this country for several years has been

more to mitigate the effects of accidents than to prevent them altogether. It would hardly be practicable to draw conclusions from the figures above, however, as the proportion of fatalities depends very largely on the proportion of slight accidents reported, which may easily vary from year to year.

We hope hereafter to give some comparisons of these railroad casualties with those reported on foreign roads. We may say beforehand, however, that these comparisons will be imperfect, by reason of the impossibility of ascertaining the passenger and train mileage on American railroads. The proper test would be made by putting side by side the number of casualties occurring to a given amount of work in the different countries. This can be done for a few of our States, but not for the country as a whole.

## Opening of the New York Elevated Railroad to Central Park.

After twenty or thirty years of agitation, of talk and of resolutions and legislation almost innumerable, New York now has a rapid-transit railroad from the Battery to Central Park, a distance of five miles. Under the date of January 14 the New York Elevated Railroad Company issued the following invitation:

"An excursion train will be run over the road of this company from the Battery (No. 7 Broadway) to the Central Park and return, on Monday next, Jan. 17, as per time-table annexed.

"You are respectfully invited, etc."

The time-table gave the names of the stations as follows: Battery, Liberty, Warren, Franklin, Canal, Houston, West Eleventh, Twelfth, Twenty-first, Thirtieth, Thirty-fourth, Forty-second, Fiftieth and Fifty-ninth streets. The running time given in the time-table from the Battery to Fifty-ninth street, or Central Park, was thirty-four minutes, and in the other direction twenty-nine. The excursion party consisted of about one hundred persons, among whom were the Rapid Transit Commissioners appointed by the act of the Legislature last winter. The run was made to the Park very nearly on schedule time, but a delay occurred on the return, owing to the road being obstructed with trains, which must always be the case so long as there is but a single track. On the return of the party to the Battery, the company entertained their guests in "an upper room" of their office building.

Trains will hereafter be run regularly from the Battery to Central Park. The schedule just issued has 39 in each direction, the shortest time being thirty minutes. Trains will also be run on Sunday hereafter.

The increase in the number of passengers carried by the road has been very large in the last year, especially since the extension to Forty-second street. In November last, the first month after the completion of this extension, the number of passengers was 131,561 against 59,841 in the corresponding month of 1874. In December last the number was 144,105 against 67,706 in December, 1874, showing an increase of 76,379. In this month, up to Saturday night—thirteen week days, including one holiday—the number of passengers was 72,496. This was an increase of 40,153 over the same period in 1875, when the number was 32,496. The average daily number of passengers is more than 5,700, which will doubtless be increased very much by the extension to Central Park.

Although the opening of this road has attracted very little attention, it is, we think, a very important event to New York; and probably very few persons realize the change it is certain to effect in the relations of different localities. Practically it moves a large section of the city lying on the west of Central Park to about half the distance to "down town" that it was before. Already the effect upon the value of real estate on the west side is being felt, and of course every person who abandons a house further down town will leave a vacancy, and this will have a tendency to reduce rents. It will thus spread population over a larger area, and help in a great measure to obviate the evils of overcrowding which are now so very great, if regarded from either a moral, political or a sanitary point of view.

This road is, we believe, the first successful application of steam power to street travel. There are such roads as the London underground lines, and the section of the Harlem and New York Central in Fourth avenue in this city, by which different sections are connected together; but in these the nature of the travel is quite distinct from that on ordinary streets. The New York Elevated Railroad is, however, located on the street itself, and such a road could be located on the most crowded thoroughfare without obstructing but rather facilitating the traffic and travel on the street itself. That this system of overhead railroads is destined to be very extensively employed, there can be little doubt, and we think it may be discerned the remedy which civilization will provide for the evil of crowded populations which seems to attend its advancement the world over. The effect of this system may be, as we have heretofore pointed out, to change, in a great measure, the whole character of metropolitan life, to concentrate in a small area the places of business, and to scatter the houses



of the residents over a larger area, and to cover large sections in the vicinity of cities with suburban or semi-suburban residences.

The extension of the Elevated Railroad to the Park is at any rate a practical solution of the question of which we have all talked so much, and it only needs to be shown now that such roads will be profitable to overcome the stolid inertia and the brutal selfishness which have so long been able to obstruct the introduction of a system which will give an outlet to the population of New York, and, in a measure at least, afford the means of escape from the squalor, filth and pestilence which lurk in the shadows of our tenement houses and in the crowds who are herded under their roofs.

This road has passed through a great many vicissitudes. Two years ago we published a short account of its history, from which we will repeat the main facts:

The plan for this road was originated by Mr. C. T. Harvey, and a company was organized and application was made to the Legislature for a charter empowering it to construct an experimental line. This was passed April 22, 1867. Section 2 of this act was substantially as follows:

"The railway hereby authorized shall be operated exclusively by means of propelling cables attached to stationary engines, placed beneath or beyond the surface of any street through which such railway may pass, and shall be concealed from view so far as the same may be detrimental to the ordinary uses of said streets. The structure shall consist of a single track, upon which the cars are to be moved in contrary directions upon opposite sides of the street, which track shall not exceed five feet in width between center of rails, and shall be supported by a series of iron columns not exceeding eighteen inches in diameter at surface of pavement, or equivalent space (if in an elliptical form,) which columns shall be placed at intervals of not less than twenty feet (except at street crossings or sidings), along the curbstone line between the sidewalk and carriage way, and attached at their upper extremities to the track aforesaid, so that the centre of the track shall be perpendicular to the centre of the columns, and at a distance of not less than fourteen feet above the surface of the pavement. Whenever deemed necessary to prevent oscillation of the track aforesaid, a second series of columns may be extended on the building side of the sidewalk, at intervals of not less than twenty feet, which shall not be more than nine inches in diameter at surface of pavement, and shall be so placed as not to obstruct any existing door or window without the consent of the owner, and from the upper extremity of which braces or girders may be extended to the first series of columns mentioned for purposes aforesaid."

After the passage of this act the company proceeded to erect on the east side of Greenwich street an experimental section extending from the Battery to Dey street, a distance of about half a mile. This was completed in the month of July, 1868. After the construction of this portion, which was built with Phoenix wrought-iron columns, the company felt sufficient confidence in the plan to extend the road through Greenwich street and Ninth avenue to Thirtieth street. This was completed in the spring of 1870. The originator of the plan proposed to use endless chains, or rather wire rope cables, worked by stationary engines for moving the trains. As soon as the road was completed to Thirtieth street, experiments were made to test the practicability of the road, and of the method proposed to propel the cars. After expending large amounts of money in these experiments, it was soon shown that the plan was totally impracticable and a failure in every respect. Meanwhile those who had contributed large sums towards its construction lost confidence in the project, and the road was finally placed in the hands of trustees and ultimately sold under foreclosure of mortgages held by various parties. A new company was then organized called the New York Elevated Railroad Company, with a capital of \$10,000,000, of which \$800,000 is said to have been paid up. Meanwhile the wire-rope system had been abandoned and removed, and a light four-wheeled engine had been constructed and placed on the road. This proved so successful that the company commenced transporting passengers April 20, 1871. The road rapidly gained in favor, so that more engines and cars were needed. New cars were therefore built, an engraving of which was published in the *Railroad Gazette* of August 17, 1872, and the construction of which is shown in the perspective view of the road in this number (published Jan. 24, 1874.)

After the failure of the wire-rope system, the road became a standing object of ridicule. It was obvious that there were grave defects, not only in the method of propelling the cars, but in the construction of what might be called the sub-structure. The supporting columns consisted of 16-inch Phoenix columns, which were made with two curved branches at the top, similar to the limbs of a tree. These, it soon appeared, were very weak, and were at once strengthened with braces. Last year the company determined to improve on the first plan employed and erected another section at the upper end of the line, extending from Thirtieth to Thirty-fourth street. This was designed by and erected under the supervision of the Superintendent of the line, Mr. D. W. Wyman, who had also designed the engine and cars, and who brought order out of chaos, and from a road which was universally pronounced a complete failure has developed a line which has steadily grown in public favor, and has clearly demonstrated the practicability of roads built on this system.

The new portion of the line which we have illustrated (Jan. 24, 1874) consists of columns formed out of four round, solid wrought-iron bars  $4\frac{1}{2}$  inches in diameter, bent into the shape represented. These are attached to a heavy cast-iron foundation plate bolted down to a foundation of masonry. At the top, the wrought-iron bars are bent outward into four branches, two of which are for lateral support, and two for longitudinal stiffness. The four bars are tied together with wrought-iron bands at the neck of the columns, or just below the point from which the bars begin to branch outward, and also at the top. These columns are placed from 30 to 60 feet apart, and the roadway between is supported on two wrought-iron girders, each formed of two 12-inch channel bars. These are trussed at the street crossings, but not in the shorter spans. The stations are usually placed over the street crossings with the stairs leading down the cross street.

Last year the company made some further addition to their track, and adopted a form of posts designed by Mr. Charles Macdonald, C. E., which was illustrated in the *Railroad Gazette* of July 3, 1875. In this the support consists of four posts distributed in a similar manner to the round posts designed by Mr. Wyman. Each of Mr. Macdonald's posts consisted of four 3-inch angle irons riveted back to back, forming a cruciform section. As the portion erected by Mr. Macdonald was somewhat of an experimental character, the posts were "built up" of angle iron instead of being made of solid cruciform bars, in order to avoid the cost of making the necessary rolls,

The extension of the road from Thirty-fourth street was built by the American Bridge Company of Chicago, and was similar to that designed by Mr. Macdonald, excepting that I beams were used for the posts instead of the angles. The new portion of the road has a very strong appearance, and seems to have all the stability needed in a structure of this kind. Quite contrary to the ordinary impressions, there is much greater need of longitudinal than of transverse stability. It is necessary, in order to allow for expansion and contraction of the girders, to leave them free to move at every alternate post. The longitudinal strain caused by the application of the brakes and the sudden checking of the motion in the train must be resisted by two or three posts, and cannot be distributed along the whole line. Applying the brakes suddenly produces a very much greater strain than is supposed, unless it is remembered that all the actual energy in the train which is arrested by the brakes must be resisted by the columns to which the girders are attached and on which the train rests.

The East Side Rapid Transit Commissioners have announced their readiness to give a hearing to those who oppose rapid transit on the route selected, which is through the Bowery and Third avenue, and the company organized to build this road promise that as soon as the right to build it is legally established its road will be put under contract within thirty days.

The Gilbert Elevated Railroad Company, whose line is up West Broadway, South Fifth avenue, Amity street and Sixth avenue, have quite recently asked for and received bids from a number of the most prominent bridge building firms for the construction of their road, but it is doubtful whether they will make a bona fide contract for its immediate construction. Rapid transit, for which New Yorkers have so long hoped, is, however, now an established fact, and the indications are, that the stimulus it has received will soon give us all the facilities of that kind that are needed.

#### Record of New Railroad Construction.

This number of the *Railroad Gazette* has information of the laying of track on new railroads as follows:

**Old Colony.**—In November, 1875, this company extended the track of the *Fall River, Warren & Providence* road from a point near the terminus in Somerset, Mass., eastward 2.16 miles, across the Taunton River to a connection with the Old Colony Railroad in Fall River. It was opened for business Dec. 6.

**Denver & Rio Grande.**—On the *Trinidad Extension* late in December, 2 miles of track (3 ft. gauge) were laid, from Pueblo southward.

**Scioto Valley.**—Track is laid from Columbus, O., south to Asheville, 12 miles.

**Hot Springs.**—Extended from Lawrence, Ark., westward  $4\frac{1}{2}$  miles, to a point  $22\frac{1}{2}$  miles from the junction with the St. Louis Iron & Southern at Malvern.

This a total of 20 $\frac{1}{2}$  miles of new railroad, 4 miles of which certainly, and probably more, were completed in 1875.

THE PURCHASE OF THE RAILROADS BY THE GERMAN EMPIRE has been reported by the daily press recently as something virtually determined upon. The German newspapers indicate that what has been proposed so far is that the Railroad Bureau of the Empire should make an inquiry into the policy of taking such a step, and that Prince Bismark had declared it desirable that the Empire should have all the railroads directly under its control, while in military circles the movement was generally favored. In Germany the Government does not often take important steps without investigation, and heretofore there has been no movement whatever—that is, no official movement—towards State ownership. Germany has the mixed system; the State owning some of the railroads, and corporations others; though when we speak of Germany, we speak of an assemblage of countries recently united into one, some of the little ones having owned (and still owning) all their roads. Now Bavaria, a considerable country by itself, has its railroad system independent of that of the Empire; and since entering the Empire, within the past year, indeed, it has completed the purchase of all its roads, a large part of which it always worked.

If the investigation is completed and reported upon favorably, that will by no means insure the adoption of the policy. There is great difference of opinion in Germany, and some of its leading men are warm advocates of the entire abandonment of railroad business to private enterprise; which would be as much of a change there as would be the purchase of half the leading lines by the Government in England or the United States.

A SWISS CORRESPONDENT calls attention to the great share taken by foreign banking houses in inducing the uninformed public to invest in bonds which the negotiators sold simply because they made a large profit on them, knowing them to be poor securities, or at least having no reason to believe them to be good. This is a matter which has never been sufficiently exposed. It is doubtless true that for a large proportion of the bonds sold in Germany the firms negotiating them received commissions so extravagantly large as of itself to indicate that the security could not be good; and that many never troubled themselves to ascertain the character of the promoters of the companies or the prospects of the roads. This, however, is the sin of another country, which we need not trouble ourselves about much because we have sundry motives and beams in our own eyes which need removing before we can with good grace or much chance of success give attention to our neighbors'

defects. It is, however, quite true that many of our most unfortunate enterprises were promoted by perfectly honest men. But under the prevailing system these promoters were not likely to have the knowledge needed to form a good opinion of the value of a new route for traffic, nor even to have a very strong direct personal interest in the road they were building.

THE UNITED STATES ROLLING STOCK COMPANY is recommended by its directors to make a dividend of 12 shillings sterling per share (\$2.94 gold) from the net earnings of the past year. The average earnings of its rolling stock for the year 1875 were \$671 for locomotives, \$607 for passenger coaches, \$377 for baggage cars, and \$89 for freight cars, much of the stock having lain idle most of the time.

#### NEW PUBLICATIONS.

**Safety Valves.** By Richard H. Buel, M. E. D. Van Nostrand, New York.

This little book is a reprint of the articles which appeared in the *Railroad Gazette*, and forms the twenty-first of the "Science Series" of the above publisher. As the readers of the *Railroad Gazette* are already familiar with the matter it contains, no further mention is needed, except to commend the plain and simple manner in which it is written. The calculations are all given arithmetically, so that the whole book will be intelligible to any one acquainted with the simple rules of arithmetic. Any one interested in the subject of safety valves—and all who use steam engines should be—will find this the most practical and useful treatise on this often imperfectly understood subject.

#### Transportation in Congress.

In the House on the 12th:

Mr. Gunter, of Arkansas, introduced a bill granting public lands in Arkansas, with the Fort Wayne Reservation, to aid in the construction of the Northwestern Arkansas Railroad.

Mr. Hedder, of Dakota, introduced a bill to incorporate the Dakota & Montana Railroad Company.

In the Senate on the 17th:

Mr. Booth, of California, introduced a bill in relation to land heretofore granted to railroad companies.

Mr. West, of Louisiana, introduced a bill to amend the original act granting aid to the Pacific railroads, providing for the collection of the interest paid by the Government on the bonds which, by the recent decision of the Supreme Court, does not become due from the companies until the principal is due, near the close of this century. It was referred to the Judiciary Committee.

Mr. West also introduced a bill to recover from the Union and Central Pacific companies the amount of bonds and interest paid thereon above \$50,000,000, claiming that the law limited the total subsidy to this amount, whereas about \$53,300,000 was issued.

Referred.

Mr. Spencer, of Alabama, introduced a bill to incorporate the Suburban Railroad Company of the District of Columbia.

Mr. Kelly, of Oregon, from the Committee on Railroads, reported a bill to extend the time for the completion of the Northern Pacific, with amendment. Ordered printed and recommended.

Mr. Cameron, of Pennsylvania, presented petitions from citizens of Pennsylvania for aid to the Texas & Pacific.

In the House on the 17th:

Mr. Woodworth, of Ohio, introduced a bill to establish a bureau of transportation.

In the Senate on the 18th:

Mr. Alcorn, of Mississippi, introduced a bill granting the right of way through the public domain to the Birmingham & St. Louis Railroad.

Mr. Mitchell, of Oregon, from the Committee on Railroads, reported, without amendment, the Senate bill extending the time for the completion of the Oregon Central Railroad and Telegraph from Portland to Astoria and McMinnville.

In the House on the 18th:

Mr. Henkle, of Maryland, introduced a bill to incorporate the Suburban Railroad Company, of the District of Columbia, and one to aid in the construction of the Southern Maryland Railroad.

#### General Railroad News.

##### ELECTIONS AND APPOINTMENTS.

**New York, New Haven & Hartford.**—At the annual meeting in New Haven, Conn., Jan. 12, the old board was re-elected, as follows: Chester W. Chapin, Springfield, Mass.; C. M. Pond, Henry C. Robinson, Hartford, Conn.; E. M. Reed, E. H. Trowbridge, George H. Watrous, New Haven, Conn.; Wm. D. Bishop, Nathaniel Wheeler, Bridgeport, Conn.; Wilson G. Hunt, George N. Miller, Augustus Schell, Cornelius Vanderbilt, A. R. Van Nest, New York.

**Smyrna & Delaware Bay.**—At the annual meeting in Smyrna, Del., last week, the following directors were chosen: H. C. Douglas, J. H. Hoffecker, J. Frank Wild, N. F. Wild, of Delaware; W. B. Sneden, Long Branch, N. J.; J. F. Bingham, Wm. Heath, New York. The board re-elected Wm. B. Sneden, President; J. F. Bingham, Secretary and Treasurer.

**Springfield, Jackson & Pomeroy.**—At the annual meeting in Waverley, O., Jan. 3, the following directors were chosen: W. W. Bell, H. L. Chapman, J. F. Ely, James Emmitt, John Foos, R. K. Seymour, J. F. Warder. The board elected James Emmitt, President; Samuel A. Henszey, Secretary; H. E. Ware, Treasurer.

**Sunbury & Lewistown.**—The bondholders for whose account this road was bought at foreclosure sale over a year ago have at last organized a new company by electing Aaron Fries, President, with the following directors: Daniel Buck, Philadelphia; George Schreiner, Beltsville, Pa.; R. W. Shenk, Lancaster, Pa.; George Shannon, Norristown, Pa.; Josiah Hart, Doylestown, Pa.; W. Budd Deacon, Mount Holly, N. J.

**Pittsburgh, Virginia & Charleston.**—At the annual meeting in Pittsburgh, Pa., Jan. 10, the following directors were chosen: H. B. Hayes, W. J. Howard, B. F. Jones, Geo. V. Lawrence, Alex. Patton, John Scott, David A. Stewart, M. B. Thompson, Joseph Walton. The board elected John Scott, President; B. F. Jones, Vice-President.

**Wilmington & Western.**—At the annual meeting in Wilmington, Del., last week, the following directors were chosen: Jas. Bradford, John Jones, James L. De You, H. M. Jenkins, Henry Grant, Wm. Tatnall, Wm. G. Phillips, Geo. Springer, Hugh De Haven.

**Lancaster & Reading.**—At the annual meeting in Lancaster, Pa., Jan. 10, J. B. Kaufman was chosen President, with the following directors: R. W. Shenk, J. H. Peacock, G. W. Hensol, D. G. Swartz, A. C. Bitner, J. D. Skiles, W. L. Peiper, A. Hollinger, C. M. Hess, H. Carpenter, J. Keller, F. V. Caboon, Lancaster,



Pa.; A. Herr, Pequea, Pa. William Leaman was chosen Secretary.

**Erie Railway Conductors' Mutual Relief Association.**—At the annual meeting in Port Jervis, N. Y., last week the following officers were chosen: President, R. H. Stuart, Elmira, N. Y.; Vice-President, B. R. Carr, Port Jervis, N. Y.; Grand Secretary and Treasurer, C. O. Graves, Elmira, N. Y.; Directors, Chauncey Hale, Eastern Division; W. J. Van Wormer, Delaware Division; A. A. Pattengill, Susquehanna Division; R. A. Mead, Western Division; J. C. Davenport, Buffalo Division; N. B. Bassett, Rochester Division.

**St. Louis, Vandalia & Terre Haute.**—At the annual meeting in Greenville, Ill., Jan. 11, the annual report was read and the following directors chosen: Thomas D. Messler, Pittsburgh, Pa.; Thomas A. Scott, Philadelphia; W. R. McKee, W. E. Edwards, Terre Haute, Ind.; Robert Dulaney, Marshall, Ill.; J. F. Alexander, A. G. Henry, Greenville, Ill.; Otto Brodbeck, Highland, Ill.; J. B. Pears, Collinsville, Ill. The board subsequently organized and elected Thomas D. Messler, President; Williamson Plant, Secretary; W. H. Barnes, Treasurer. The road is worked by the Terre Haute & Indianapolis Company.

**Southern Minnesota.**—Mr. John M. Egan has been appointed Chief Engineer, in place of D. Brown, who has resigned.

**Champlain Transportation Co.**—At the annual meeting in Burlington, Vt., Jan. 5, the following directors were chosen: Vernon P. Noyes, Burlington, Vt.; John B. Page, Z. V. K. Wilson, Rutland, Vt.; I. V. Baker, Comstock's Landing, N. Y.; A. N. Inman, Crown Point, N. Y.; George B. Chase, Boston; Le Grand B. Cannon, New York. The board elected Le Grand B. Cannon, President; John B. Page, Vice-President; V. P. Noyes, Treasurer; P. W. Barney, General Superintendent; Eliza Boot, Chief Engineer.

**Central Vermont.**—B. B. Smalley, of Burlington, Vt., and Bradley Barlow, of St. Albans, Vt., have been chosen directors, in place of Messrs. Estey and Cox, resigned.

**Pennsylvania & New York.**—At the annual meeting in Philadelphia, Jan. 10, Robert H. Sayre was re-elected President, with the following directors: A. A. Packer, Wm. W. Longstreth, Chas. Hartshorne, Robert A. Packer, V. E. Piolet, Garrett B. Linderman, J. Henry Swoyer, John J. Taylor, Robert Lockhart, John W. Hallenbeck, Wm. H. Sayre, E. P. Wilbur. The board elected Charles Hartshorne, Secretary and Treasurer.

**Philadelphia, Wilmington & Baltimore.**—At the annual meeting in Wilmington, Del., Jan. 10, the following directors were chosen: Isaac Hinckley, Samuel M. Felton, Wm. Sellers, Samuel Welsh, Charles Warner, Joseph Bringham, Samuel Harlan, Jr., Thomas Kelso, Enoch Pratt, Thomas Donaldson, Thomas Whitridge, Samuel M. Shoemaker, Jacob Tome, Charles P. Bowditch, Nathaniel Thayer. The board re-elected Isaac Hinckley President; Enoch Pratt, Vice-President; Alfred Hornor, Secretary and Treasurer.

**Norwich & Worcester.**—At the annual meeting in Norwich, Conn., Jan. 12, the old board was re-elected, as follows: A. F. Smith, John F. Slater, Norwich, Conn.; Francis H. Dewey, G. W. Gill, Charles W. Smith, Edward L. Davis, Worcester, Mass.; Wm. F. Weld, Charles Merriam, Boston; Robert Bayard, New York. The board re-elected A. F. Smith President and Managing Agent; Edward T. Clapp, Secretary; George L. Perkins, Treasurer.

**Junction & Breakwater.**—At the annual meeting in Milford, Del., Jan. 10, the following directors were chosen: C. S. Watson, C. C. Stockley, Benj. Burton, E. D. Hitchens, Harbison Hickman, N. C. McReady, John Bodine, Thomas Baumgardner, George K. Reed. The board elected N. C. McReady President; J. Y. Foulks, Secretary; W. T. Vales, Treasurer; Thomas Groome, Superintendent.

**Ohio & Baltimore Short Line.**—At the annual meeting in Washington, Pa., Jan. 10, the following directors were chosen: C. M. Reed, W. W. Smith, Thomas McKenna, Wm. Workman, S. B. Hayes, Wm. Keyser, T. H. Garrett, John K. Cowen. The board elected C. M. Reed, President; J. B. Washington, Secretary; Wm. H. Hama, Treasurer; W. T. Thelin, Auditor; James L. Randolph, Chief Engineer.

**Boston & Providence.**—Mr. Henry A. Whitney has been chosen President, in place of Gov. John H. Clifford, deceased. Mr. Whitney has been a director for a number of years and was Acting President during Gov. Clifford's absence in Europe last year.

**Philadelphia & Reading.**—The board of managers has re-elected J. W. Jones First Vice-President and G. A. Nicolls Second Vice-President.

**Bedford & Bridgeport.**—At the annual meeting in Philadelphia, Jan. 10, John Cessa was chosen President, with the following directors: John Alsop, G. W. Anderson, Josiah Bacon, Wm. Chenoweth, J. G. Hartley, Wm. J. Howard, J. N. DuBarry, J. M. Kennedy, John W. Lingenfelter, G. B. Roberts, Edmund Smith, Wistar Morris. The road is leased to the Pennsylvania.

**Mifflin & Center County.**—At the annual meeting in Philadelphia, Jan. 10, Strickland Kneass was chosen President, with the following directors: Josiah Bacon, Edmund Smith, Wistar Morris, J. M. Kennedy, George B. Roberts, James M. Mann, Samuel MacLay, G. W. Elder, J. P. Green, Alex. Biddle, T. A. Scott, Wm. J. Howard. The road is leased to the Pennsylvania.

**Philadelphia & Merion.**—At the annual meeting in Philadelphia, Jan. 10, George B. Roberts was chosen President, with the following directors: R. D. Barclay, John P. Green, Joseph Lesley, Josiah Bacon, Thomas A. Scott, A. J. Derbyshire, Strickland Kneass, N. P. Shortridge, Wm. M. Spackman, Wm. J. Howard, Wistar Morris, Edmund Smith.

**East Broad Top.**—At the annual meeting in Philadelphia, Jan. 10, Wm. A. Ingham was chosen President, with the following directors: Ario Pardee, J. Gillingham, George B. Markle, Edward Roberts, Jr., Edward K. Wood, Percival Roberts, Charles Hecker.

**Bell's Gap.**—At the annual meeting in Philadelphia, Jan. 10, A. L. Massey was chosen President, with the following directors: John Reilly, C. S. Wurtz, J. H. Converse, S. G. Lewis, E. Smith.

**Western Pennsylvania.**—At the annual meeting in Philadelphia, Jan. 10, Strickland Kneass was chosen President, with the following directors: George B. Roberts, Edmund Smith, Josiah Bacon, Wistar Morris. The board elected James R. McClure Secretary and Treasurer. The road is leased to the Pennsylvania.

**Southwest Pennsylvania.**—At the annual meeting in Philadelphia, Jan. 10, G. B. Roberts was chosen President, with the following directors: Thomas A. Scott, Strickland Kneass, Wm. J. Howard, A. J. Derbyshire, John K. Ewing, Robert Hogsett, D. R. Davidson, B. F. Ruff, George Torrance, Israel Painter, J. F. Wentling, J. N. DuBarry. The road is leased to the Pennsylvania.

**Columbia & Port Deposit.**—At the annual meeting in Philadelphia, Jan. 10, the following directors were chosen: Strickland Kneass, Thomas A. Scott, George B. Roberts, Edmund Smith, Wm. J. Howard, Wistar Morris, Josiah Bacon, J. M. Kennedy, N. P. Shortridge, Alexander Biddle, Joseph Lesley, Jacob Tome, Maris Hoopes. The board elected Strickland Kneass President and James R. McClure Secretary and Treasurer.

**Philadelphia & Trenton.**—At the annual meeting in Philadelphia, Jan. 10, the following directors were chosen: Strickland Kneass, N. P. Shortridge, Josiah Bacon, Wistar Morris, A. J.

Derbyshire, J. M. Kennedy, Alexander H. M. Phillips, Thomas A. Scott, Edmund Smith, George B. Roberts, G. M. Dorrance. The board elected Strickland Kneass President; J. R. McClure, Secretary; William Taylor, Treasurer. The road is leased to the Pennsylvania.

**Trescow.**—At the annual meeting in Philadelphia, Jan. 10, E. W. Clark was chosen President, with the following directors: E. W. Clark, O. F. Howell, Alex. Biddle, George Whitney, J. M. Wilcox, F. Hazard. The road is leased to the Central of New Jersey.

**Lehigh & Lackawanna.**—At the annual meeting in Philadelphia, Jan. 10, Charles Brodhead was chosen President, with the following directors: A. Wille, E. W. Clark, John Leisenring, F. R. Cope. The road is leased to the Central of New Jersey.

**Nequehoning Valley.**—At the annual meeting in Philadelphia, Jan. 10, J. B. Moorehead was chosen President, with the following directors: G. Whitney, S. Mason, F. R. Cope, E. W. Clark, C. Wheeler, F. Hazard, P. C. Garrett, A. J. Derbyshire, J. V. Williamson, G. T. C. Henry, J. T. Jeanes. The road is leased to the Central of New Jersey.

**East Pennsylvania.**—At the annual meeting in Philadelphia, Jan. 10, Franklin B. Gowen was chosen President, with the following directors: A. E. Borie, Morton P. Henry, R. B. Cabene, J. B. Lippincott, James E. Gowen, G. D. Stutzell, Thomas Hart, Jr., J. Stichter. The board elected Howard Hancock Secretary and John Welch Treasurer. The road is leased to the Reading.

**Reading & Columbia.**—At the annual meeting in Philadelphia, Jan. 10, Franklin B. Gowen was chosen President, with the following directors: A. E. Borie, R. B. Cabene, H. P. McKean, J. B. Lippincott, John Ashhurst, John Tucker, G. A. Nichols, F. Lauer, T. Baumgardner, George Bogie, W. T. Case, Samuel Small. The board elected Howard Hancock Secretary and John Welch Treasurer. The board is controlled by the Reading.

**Philadelphia, Newtown & New York.**—At the annual meeting in Philadelphia, Jan. 10, Alfred Blaker was chosen President, with the following directors: Smith Harper, Cyrus Hillborn, H. G. Sichel, Charles Willard, B. J. Smith, Charles Robbins.

**Chester Valley.**—At the annual meeting in Philadelphia, Jan. 10, John F. Gilpin was chosen President, with the following directors: F. B. Gowen, Coffin Colket, Charles P. Smith, H. P. McKean, R. B. Cabene, A. E. Borie, Wm. H. Holstein. The road is controlled by the Philadelphia & Reading.

**Allentown.**—At the annual meeting in Philadelphia, Jan. 10, Franklin B. Gowen was chosen President, with the following directors: H. P. McKean, A. E. Borie, R. B. Cabene, J. B. Lippincott, John Ashhurst, C. E. Smith. Howard Hancock was chosen Secretary, and John Welch, Treasurer. The road is leased by the Reading.

**East Mahanoy.**—At the annual meeting in Philadelphia, Jan. 10, Franklin B. Gowen was chosen President, with the following directors: H. P. McKean, A. E. Borie, R. B. Cabene, J. B. Lippincott, John Ashhurst, C. E. Smith. The board elected Howard Hancock Secretary, and John Welch, Treasurer. The road is leased by the Reading.

**West Chester & Philadelphia.**—At the annual meeting in Philadelphia, Jan. 10, Edward Hoopes was chosen President, with the following directors: J. E. Farnum, Matthew Baird, S. J. Harpless, A. C. Roberts, Samuel Biddle, Charles Fairbank, Lorenzo Peck, George Callaghan, Dennis B. Kelly.

**Northeast Pennsylvania.**—At the annual meeting in Philadelphia, Jan. 10, Franklin A. Comly was chosen President, with the following directors: John Jordan, Jr., J. Gillingham, Fell, Wm. C. Ludwig, Ellwood Shannon, E. C. Knight, Alfred Hunt, Wm. C. Kent, Thomas Smith, G. J. Mitchell, Isaac Warner, Jr., George Fulmer, J. B. Larzelere. The road is worked by the North Pennsylvania.

**Central of Georgia.**—At the annual election in Savannah, Ga., Jan. 9, the following directors were chosen: W. M. Wadley, W. B. Johnson, Moses Taylor, J. F. Bozeman, J. J. Gresham, George Cornwall, A. S. Hartridge, Andrew Low, W. R. Garrison, E. C. Anderson, Charles Mills, G. M. Sorrel, Octavius Cohen.

**Jefferson City, Lebanon & Southwestern.**—At the annual meeting in Jefferson City, Mo., Jan. 8, the following directors were chosen: Green C. Berry, J. M. Clark, Phil. E. Chappel, E. M. Davidson, Fred. Fischer, Jas. E. Carter, R. P. Melton, W. Parks, Thos. G. Hart.

**Delaware.**—At the annual meeting in Dover, Del., Jan. 13, the following directors were chosen: S. M. Felton, Isaac C. Hinckley, Andrew Gray, Charles Warner, Joseph Bringham, Edward Bringham, Jr., Isaac Jump, Henry B. Fiddeman, Manlove Hayes, Alexander Johnson, Wm. H. Ross, Albert Curry, J. Turpin Moore. The board re-elected S. M. Felton President and Manlove Hayes Secretary and Treasurer. The road is worked by the Philadelphia, Wilmington & Baltimore.

**New York Cheap Transportation Association.**—At the annual meeting in New York, Jan. 18, the following directors were elected: H. B. Claffin, B. G. Arnold, George A. Merwin, W. S. Fairfield, A. B. Miller, H. B. Miller, Franklin Edson, B. P. Baker, Chas. Watrous, Wm. Duryea, Theo. F. Lees, W. F. Kidder, J. Spencer Turner, F. B. Thurber, F. A. Schroeder, D. C. Robbins, W. H. Hurlburt, Harvey Farrington, E. B. Durkee, John F. Henry, John Dwight, W. I. Preston, W. H. Wiley, Benj. Lichtenstein, George Brown, James S. Barron, James Pyle, Mayer Lehman, E. F. Browning, Jordan L. Mott, J. P. Robinson, F. A. Conkling, B. L. Ackerman, Darwin B. James, Simon Sterne, Theo. E. Allen. The board afterwards elected officers as follows: B. F. Baker, President; H. B. Claffin, John F. Henry and Franklin Edson, Vice-Presidents; F. B. Thurber, Secretary, and C. R. Durkee, Treasurer. John F. Henry, B. P. Baker, C. R. Durkee, C. S. Watrous and W. H. Wiley were elected an Executive Committee.

**Scioto Valley.**—At the annual meeting in Columbus, O., Jan. 13, the following directors were chosen: Wm. Moneybenny, Samuel Thomas, E. T. Mithoff, John G. Mitchell, F. C. Sessions, W. B. Hayden, Columbus, O.; Matthias Lewis, Chillicothe, O.; J. Groce, Circleville, O.; W. A. Hutchins, Portsmouth, O. The board elected E. T. Mithoff, President; W. N. Dennison, Secretary; F. C. Sessions, Treasurer; M. A. Dougherty, Attorney; George D. Chapman, General Manager; Joel Hunt, Chief Engineer.

**South Mountain.**—At the annual meeting in Jonestown, Lebanon County, Pa., last week, the following directors were chosen: Wm. H. Bell, Jacob G. Heilman, Simon Heilman, Jonestown, Pa.; David M. Rank, Christian S. Maulfair, Grantville, Pa.; John A. Ulrich, Jacob Ulrich, East Hanover, Pa.; Jacob W. Grove, Fredericksburg, Pa.; Fredrick Harner, Bethel, Pa.; Henry Brobst, Behrensburg, Pa.; Michael Miller, Straoustown, Pa.; Henry Cameron, Mount Nebo, Pa.; Elias Stoudt, Bernville, Pa.; John M. Luck, Lebanon, Pa.; Dr. J. P. Seiler, Harrisburg, Pa. The board elected Wm. H. Bell, President; David M. Rank, Vice-President; Jacob G. Heilman, Secretary; George T. Clapp, Treasurer.

**New Orleans, St. Louis & Chicago.**—Mr. Niles Meriwether, heretofore Chief Engineer of the Memphis & Charleston, has been appointed Chief Engineer and Master of Road of this road, and took possession of his new office, which is at New Orleans, Jan. 15.

**Logansport, Crawfordville & Southwestern.**—At the annual meeting in Crawfordville, Ind., Jan. 12, the following directors were chosen: R. H. Blair, John S. Brown, Joseph Milligan, R. B. Pierce, Crawfordville, Ind.; W. B. Carter, John G. Clark,

James H. Paris, Frankfort, Ind.; N. Rice, Rockville, Ind.; A. N. Leitnaker, S. D. Schuyler, Wm. Tuell, Terre Haute, Ind.

**Chicago, Pekin & Southwestern.**—At the annual meeting in Streator, Ill., Jan. 11, it was voted to reduce the number of directors from thirteen to nine, and the following were chosen: T. W. Anthony, Washington, Ill.; F. Plumb, S. Plumb, P. B. Shumway, W. F. Sisson, A. E. Tyler, Streator, Ill.; B. H. Harris, Morton, Ill.; F. E. Hinckley, A. B. Meeker, Chicago. The board elected F. E. Hinckley, President; A. B. Meeker, Vice-President; F. Plumb, Secretary; A. E. Tyler, Treasurer; F. E. Hinckley, F. Plumb, W. F. Sisson, Executive Committee.

**Illinois & St. Louis.**—At the annual meeting in Belleville, Ill., last week, the following directors were chosen: J. W. Branch, Robert Campbell, James Clarke, Martin Herr, Russell Hinckley, S. N. Holliday, G. A. Koerner, Adolphus Meier, Jeff. Rainey, J. B. Rentchler, Nicholas Schaeffer, Philip Schuck, R. Sellow, George Swigart, B. F. Switzer. The board elected Adolphus Meier President; N. Schaeffer, Vice-President; P. T. Burke, Secretary and Treasurer; W. K. McConas, General Superintendent.

**Chicago, Dubuque & Minnesota.**—At the annual meeting in Dubuque, Ia., Jan. 5, there was a sharp contest between the Boston and Dubuque parties, ending in the success of the latter, who re-elected the old board. The following officers were chosen: President, J. A. Rhomburg; Vice-President, J. D. Bush; Secretary, Peter Kiene; Treasurer, C. H. Booth. Mr. Rhomburg succeeds Mr. J. K. Graves, who resigned just before the meeting.

**Chicago, Clinton & Dubuque.**—At the annual meeting in Dubuque, Ia., Jan. 5, this company elected the same officers and directors as the Chicago, Dubuque & Minnesota, given above.

**Chicago, Burlington & Quincy.**—The Chicago Tribune gives currency to a report that Mr. Walker will decline a re-election as President of this company at the coming annual meeting, and that he will be succeeded by Mr. N. C. Forbes, of Boston. It also reports that Mr. Robert Harris will resign, and that he will be succeeded as General Superintendent by Mr. W. B. Strong, formerly his assistant and now on the Michigan Central.

## PERSONAL.

—Gen. W. J. Sewell, Superintendent of the West Jersey Railroad, who is now serving his second term in the New Jersey State Senate, has been chosen President of that body.

—Probably the oldest railroad president, in years, in the United States is Mr. Bonum Nye, President of the North Brookfield Branch Company of Massachusetts, who owns to 83 years and is still an active man. He was almost a middle-aged man when the first railroad in the country was built.

—The New Hampshire Democrats have nominated Mr. Thomas Dinamore as a candidate for the office of Railroad Commissioner, which is in that State an elective office.

—There is a rumor that Mr. Robert Harris, General Superintendent of the Chicago, Burlington & Quincy, has been offered a similar position on the New York Central & Hudson River.

—Mr. J. K. Graves has resigned his position as President of the Chicago, Dubuque & Minnesota and the Chicago, Clinton & Dubuque companies, on the ground that he is a member of the Iowa Legislature, and that measures affecting the interests of those companies are likely to come before that body.

—Mr. R. O. Caracadin, Master Mechanic of the Southwestern Division of the Chicago, Rock Island & Pacific road, and his wife celebrated the 25th anniversary of their wedding, at their residence, in Trenton, Mo., Jan. 7. The occasion was a very pleasant one, a large number of friends being present, and many valuable presents made, including a handsome silver set from the employees of the Locomotive Department. Mr. Caracadin has held his present position about five years, previous to which he had a similar one on the New York Central, at Rochester, N. Y.

—Mr. J. C. Stanton, late Trustee and Receiver of the Alabama & Chattanooga road, has brought a libel suit against Mr. Snagge, counsel for the foreign bondholders, on account of assertions and charges made in Mr. Snagge's recent argument in the foreclosure suit.

—Mr. George S. Bangs, the Superintendent of Railway Mail Service, whose resignation has been reported, to take effect Feb. 1, has been appointed by the President to be Assistant Treasurer of the United States at Chicago.

## TRAFFIC AND EARNINGS.

### Michigan Freight Rates.

A meeting of the general freight agents of Michigan and Northern Ohio was held in Detroit, Jan. 13, the lines represented being the Cincinnati, Sandusky & Cleveland, the Cincinnati, Hamilton & Dayton, the Pennsylvania Company, the Baltimore & Ohio, the Michigan Central, the Detroit, Lansing & Lake Michigan, the Lake Shore & Michigan Southern, the Grand Rapids & Indiana, the Fort Wayne, Jackson & Saginaw, the Cleveland, Columbus, Cincinnati & Indianapolis, the Flint & Pere Marquette, the Lake Erie & Louisville, the Canada Southern and the Detroit & Milwaukee.

It was resolved to appoint a committee with power to invest and adjust the switching charges at Toledo; that the rates per 1,000 feet fixed at the meeting of Dec. 8 apply only to lumber shipped by lake through the lake ports or through contract rate; that the lines leading from lake ports be not allowed to put agents in the Saginaw Valley to solicit shipments by lake and rail as against all rail routes; that rates on ice be made the same as on lumber, and shippers be allowed to load 11 tons per car, one ton being allowed to cover wastage; that the rate of 18 cents per 100 lbs. on Canadian barley from Detroit to Cincinnati apply only to shipments made under through contracts; that the rates heretofore agreed on be not decreased to allow local arbitraries unless necessary to reach some competing point. The rate from Howard City to Cincinnati was fixed at not less than \$50 per car of 11 tons; from Grand Rapids or Saginaw to Cincinnati, \$45 per car; Grand Rapids or Saginaw to Wheeling or Bellaire, \$60 per car.

The next meeting was appointed for Feb. 10, at Chicago.

### Railroad Traffic.

During the month of December, the freight traffic of the Utah Central and the Utah Southern roads was as follows:

	Tons.
Utah Central.....	13,120
Utah Southern.....	6,991
Total.....	20,111

The principal item of freight on the Central was 7,045 tons of coal and coke; on the Southern, 2,811 tons of ore and bullion.

The *Altoona Sun* says: "From midnight of Dec. 31, 1874, to midnight of Dec. 31, 1875, the number of trains that passed Altoona eastward, on the Pennsylvania Railroad, was 6,552; westward, 6,807; received from Hollidaysburg Branch, 913; delivered to same, 914. The average number of trains daily over the Pennsylvania, eastward, was 21; westward, 22; delivered to Hollidaysburg Branch, 3; received from same, 3. The trains eastward averaged 40 cars per train, and westward 49 cars. The trains delivered to the Hollidaysburg Branch averaged 20 cars each, and those received from it 21 cars each. The daily average of cars passing this point eastward was 945; westward, 876; delivered



to Holidaysburg Branch, 56; received from same, 59. The number of loaded cars that went eastward during the year was 254,142; westward, 84,927; of those received from the Holidaysburg Branch during the year, 11,885 were loaded, and of those delivered to the branch, 10,227 were loaded. For the same time the year previous, 279,232 loaded cars went eastward, and 76,362 went westward; 8,384 loaded cars were delivered to the Holidaysburg Branch, and 7,958 were received from it. In the number of loaded cars going eastward there was a decrease during last year of 8.98 per cent. The number westward shows an increase of 11.21 per cent. The figures also show an increase in the receipt of loaded cars from the Holidaysburg Branch of 46.83 per cent., and an increase in the number delivered of 21.98 per cent. There were 10,960 more empty cars passed westward than eastward during the year.

#### Passenger Rates to the Centennial.

The Advisory Committee on rates to the Centennial of the General Passenger and Ticket Agents' Association met in Philadelphia, Jan. 12. The Centennial Commissioners desired to have a general reduction of 50 per cent. from regular fares to all persons visiting the exhibition, but many of the Western roads objected, on the ground that with so large a reduction a heavy travel would not make up for the loss on rates. The meeting lasted all day, and, after a long discussion, it was resolved to make a report recommending a general reduction of 25 per cent. for excursion and single fares. In view of the short time left for action, it was resolved to call a special meeting of the Association and to press the subjects of the reduction.

#### Railroad Earnings.

Earnings for various periods are reported as follows:

Year ending Sept. 30:	1874-75.	1875-76.	Inc. or Dec.	P. c.
Atlantic, Mississippi & Ohio.....	\$1,781,290	\$1,825,243	Dec.	\$44,053 2.4
Expenses.....	1,095,649	1,097,723	Dec.	2,074 0.2
Net earnings.....	\$685,631	\$727,520	Dec.	\$41,889 5.8
Earnings per mile.....	4.162	4.265	Dec.	.103 2.4
Per cent. of expenses.....	61.51	60.14	Inc.	1.37 2.3

Expenses do not include renewals of track and bridges, for which \$194,688 were paid in the last year. Including this, the expenses were 72.44 per cent. of receipts.

Year ending Oct. 31:	1874-75.	1875-76.	Inc. or Dec.	P. c.
Worcester & Nashua.....	\$494,410	\$539,897	Dec.	\$45,487 8.4
Expenses.....	336,079	369,021	Dec.	\$32,942 9.2
Net earnings.....	\$158,331	\$170,876	Dec.	\$12,545 7.3
Earnings per mile.....	10.921	11.817	Dec.	.896 8.4
Per cent. of expenses.....	67.98	68.38	Dec.	0.37 0.5

Year ending Dec. 31:	1875.	1874.	Inc. or Dec.	P. c.
Atlantic & Pacific.....	\$4,351,000	\$4,992,066	Dec.	\$631,066 12.7
Central Pacific.....	16,970,018	14,522,814	Inc.	2,447,204 16.9
Chicago, Milwaukee & St. Paul.....	8,255,744	8,953,017	Dec.	697,273 7.8
Illinois Central.....	7,892,901	7,947,585	Dec.	54,684 0.7
Indianapolis, Bloom. & Western.....	1,300,460	1,625,354	Dec.	324,714 20.0
Kansas Pacific.....	3,297,331	3,272,597	Inc.	24,734 0.8
Kokuk & Des Moines.....	792,082	706,185	Inc.	85,897 12.2
Missouri, Kansas & Texas.....	2,940,297	3,145,217	Dec.	204,920 6.5
Ohio & Mississippi.....	3,207,849	3,304,239	Dec.	96,390 2.9
Pittsburgh, Virginia & Charleston.....	123,594	137,899	Dec.	14,305 10.4
St. Louis, Alt. & T. H. & Belleville Line.....	560,700	559,346	Inc.	1,354 0.2
St. Louis, Iron Mt. & Southern.....	8,770,998	3,244,071	Inc.	5,526,927 16.2
St. Louis, Kan. City & Northern.....	2,636,707	2,587,604	Inc.	49,103 1.9

Month of November:	1875.	1874.	Inc. or Dec.	P. c.
Great Western (Canada).....	\$354,000	\$384,300	Dec.	\$30,300 7.9
Expenses.....	277,000	300,900	Dec.	23,900 7.9
Net earnings.....	\$77,000	\$83,400	Dec.	\$6,400 7.9
Per cent. of expenses.....	78.26	78.30	Dec.	0.05

Month of December:	1875.	1874.	Inc. or Dec.	P. c.
Atlantic & Pacific.....	\$411,783	\$371,836	Inc.	\$39,947 10.7
Cairo & St. Louis.....	28,947	1,970,354	Dec.	91,334 6.7
Central Pacific.....	1,279,000	1,370,354	Dec.	91,334 6.7
Chicago, Milwaukee & St. Paul.....	747,000	662,263	Inc.	84,717 12.8
Denver & Rio Grande.....	37,321	30,186	Inc.	7,135 23.6
Illinois Central.....	689,098	680,435	Inc.	1,663 0.2
Indianapolis, Bloom. & Western.....	134,069	114,075	Inc.	19,994 7.5
Kansas Pacific.....	290,279	233,401	Inc.	56,878 24.4
Kokuk & Des Moines.....	59,164	67,733	Dec.	17,569 29.0
Missouri, Kansas & Texas.....	308,068	292,705	Inc.	15,363 19.9
Ohio & Mississippi.....	307,318	303,293	Inc.	4,025 1.3
Main Line.....	34,175	.....	.....	.....
Ohio & Mississippi, Springfield Division.....	52,047	52,812	Dec.	765 1.4
St. Louis, Alt. & T. H. & Belleville Line.....	461,409	404,219	Inc.	57,190 14.1
St. Louis, Iron Mt. & Southern.....	265,536	248,543	Inc.	16,993 6.8
Toledo, Peoria & Warsaw.....	113,762	88,995	Inc.	24,767 24.9

Three weeks ending Jan. 1:	1875.	1874.	Inc. or Dec.	P. c.
Grand Trunk.....	\$119,600	\$129,400	Dec.	\$9,800 8.1
Two weeks ending Dec. 15:	.....	.....	.....	.....
Atlantic & Great Western.....	\$171,042	\$165,183	Inc.	\$5,859 3.5
Two weeks ending Dec. 31:	.....	.....	.....	.....
Great Western.....	\$23,513	\$23,879	Dec.	\$366 0.3
First week in January:	.....	.....	.....	.....
Cairo & St. Louis.....	\$5,929	.....	.....	.....
Chicago Milwaukee & St. Paul.....	115,000	\$109,000	Inc.	\$6,000 5.5
Denver & Rio Grande.....	9,321	4,477	Inc.	4,844 108.3
Missouri, Kansas & Texas.....	84,997	33,185	Inc.	51,812 65.7
Ohio & Mississippi.....	76,023	60,391	Inc.	15,632 25.9
St. Louis, Iron Mt. & Southern.....	98,590	82,944	Inc.	15,646 18.0

Denver & Rio Grande earnings for 1876 include \$3,019 contractors' freight for Trinidad Extension; deducting this, the increase is \$1,825, or 40.8 per cent.

#### Coal Movement.

The weekly report of anthracite coal production for the first week in January is as follows: 1876, 189,274 tons; 1875, 218,841 tons; decrease, 29,567 tons, or 13.5 per cent.

The resumption of production in the Schuylkill region was to have taken place this week. It is not expected, however, that there will be any general resumption, as the market has not improved and there is no demand that cannot be met from stocks now on hand at shipping and distributing points.

The following reports of anthracite tonnage for the year ending Dec. 31 have been received:

Delaware, Lackawanna & Western:	1875.	1874.	Inc. or Dec.	P. c.
Shipped north.....	1,097,924	.....	.....	.....
Shipped south.....	2,228,977	.....	.....	.....
Total.....	3,326,901	2,570,437	Inc.	756,464 29.4
Shamokin Division, Northern Central:	.....	.....	.....	.....
Total shipments.....	768,873	590,129	Inc.	178,744 30.3
Summit Branch:	.....	.....	.....	.....
Total shipments.....	523,000	446,463	Inc.	76,537 17.2
New Jersey Lines, Pennsylvania Railroad:	.....	.....	.....	.....
Coal Port for shipment.....	188,712	259,742	Dec.	71,030 27.3
South Amboy for shipment.....	318,725	639,761	Dec.	321,036 80.1
Distribution to local points.....	224,109	288,202	Dec.	64,093 22.2
Company's use.....	38,474	40,304	Dec.	4,730 11.8
Total.....	769,020	1,227,909	Dec.	458,889 37.5
Central of New Jersey, Lehigh & Susquehanna Division:	.....	.....	.....	.....
Carried east to tidal points.....	1,278,278	1,277,868	Dec.	410 0.03
" " local points.....	531,198	456,496	Inc.	74,702 16.4
Delivered at or above Manchu.....	88,581	107,987	Dec.	19,386 17.9
Delivered to Canal.....	276,637	726,766	Dec.	450,129 20.7
" " Lehigh Valley.....	104,866	141,362	Dec.	36,496 26.8
" " Lackawanna & Bloomsburg.....	.....	53,316	Dec.	53,316 100.0
Company's use.....	82,080	108,513	Dec.	26,433 24.4
Total.....	2,661,636	2,972,288	Dec.	310,652 10.5

The Lehigh & Wilkesbarre Coal Company reports a total production for the year as follows: 1875, 2,085,088 tons; 1874, 2,465,566 tons; decrease, 380,528 tons, or 15.4 per cent.

The tonnage of the Pennsylvania's New Jersey lines was derived from the following sources:

1875.	1874.	Decrease.	P. c.
Lehigh Region.....	808,591	964,129	455,538 47.8
Wyoming Region.....	267,490	263,780	3,710 0.1
Totals.....	1,075,081	1,227,909	152,828 14.2

The actual shipments from the two shipping ports for the year were:

1875.	1874.	Decrease.	P. c.
Coal Port.....	196,362	267,854	72,492 27.1
South Amboy.....	398,248	620,562	222,314 46.0
Totals.....	594,610	888,416	293,806 49.3

The annual tonnage report of the Cumberland & Pennsylvania road and Cumberland Branch is as follows:

nia road and Cumberland Branch is as follows:				
Cumberland & Pennsylvania:				
	1875.	1874.	Inc. or Dec.	P. c.
Delivered to Baltimore & Ohio.	1,066,998	1,266,011	Dec.	199,013 18.7
" " Ches. & Ohio Canal.	715,669	631,916	Inc.	83,753 13.3
" " Penn. State Line.	160,223	67,227	Inc.	92,996 138.3

The sharp competition for the carrying of this traffic has made a considerable difference in the tonnage of the various lines, although there is but little change in the total product.

#### Flour and Grain Movement.

San Francisco grain shipments for December were 19 cargoes, including 1,238,567 bushels of wheat and 49,700 barrels of flour. For the six months of the California crop year ending Dec. 31, the shipments were as follows, flour being reduced to wheat in the totals:

	1875.	1874.	Inc. or Dec.	P. c.
Flour, barrels.....	232,300	209,400	Inc.. 22,900	10.9
Wheat, bushels... ..	6,995,334	9,133,187	Dec. 2,137,853	23.4
Total bushels.....	8,038,634	10,075,427	Dec. 2,036,793	20.2

The San Francisco Bulletin estimates the surplus yet on hand at 3,580,000 bushels, of which about 670,000 bushels is engaged to load vessels now in port.

#### THE SCRAP HEAP.

##### Railroad Manufactures.

The Indianapolis Rolling Mill Company has chosen A. Jones President and Superintendent; C. B. Parkman, Secretary, and W. O. Rockwood, Treasurer for the ensuing year. The company voted to go into the manufacture of Bessemer steel on a large scale, and appointed a committee to select a site for the new works. The company's mill is now turning out a lot of 35-pound rails for the St. Louis, Bloomfield & Louisville narrow-gauge road.

The Tredgar Company, of Richmond, Va., has suspended payment and the works, which employed some 600 men, are closed. In 1873 the company became embarrassed, owing to the failure of the Chesapeake & Ohio and the New York & Oswego Midland companies to pay large amounts due by them, and an extension was granted by the creditors, who took a deed of trust to secure themselves. It is believed that the present liabilities, outside of the deed of trust, will not exceed \$100,000. A statement is being prepared.

The Lackawanna Iron & Coal Company rolled the first Bessemer steel rail at its new steel works in Scranton, Pa., Dec. 29. This makes ten Bessemer steel works now completed and in operation in the United States, with an annual capacity of about 400,000 gross tons of ingots.

The Roane Iron Company at Chattanooga, Tenn., is now turning out light rails (30 pounds per yard) for the Chester & Lenoir narrow-gauge road. The company has work on hand for some time to come, having contracts to furnish new rails or re-roll old ones for the Little Rock & Fort Smith, the Western of Alabama, the Alabama Central, the Montgomery & Eufaula, the Central of Georgia, the Nashville, Chattanooga & St. Louis and the East Tennessee, Virginia & Georgia.

A new organization, known as the Old Ferry Iron Company, has bought the old Townsend Rolling Mill at Wilmington, Del., with some adjoining property.

The Allentown (Pa.) Rolling Mill is turning out about 500 tons of rails and 350 tons of bar iron per week.

##### Recess at the Centennial to be Secured on the Cars.

At the meeting of Committee of Thirteen of the Passenger Ticket Agents Association, held at Continental Hotel Jan. 12, inst., for the purpose of establishing Centennial rates, the following resolution was unanimously adopted:

Whereas, An organization has been formed in Philadelphia called the "Centennial Lodging House Agency, Limited," for the purpose of providing proper accommodation for visitors to the Centennial Exhibition, and

Whereas, We are satisfied that in the hands of the gentlemen who have formed the organization the best interests of the visitors will be protected; therefore, be it

Resolved, That we recommend that the facilities at the command of the railroad companies in the way of permitting the

tickets of said agency to be placed on sale, and such other facilities as may be desired and can be consistently accorded said "Centennial Lodging House Agency, Limited" shall be placed at their disposal, and that we will recommend to the patrons of our roads who may be unable to secure hotel accommodations in Philadelphia, to avail themselves of the advantages afforded by this agency.

#### Bessemer Steel Nails.

The Albany & Rensselaer Iron and Steel Company is now manufacturing nails of Bessemer steel. While costing 50 cents per keg more than iron nails, it is claimed that they are from 12 1/2 to 15 per cent. lighter, that they are all sound, there being no waste whatever. The New York Central Railroad and some other large consumers are now using them.

#### OLD AND NEW ROADS.

##### New York, New Haven & Hartford.

At the annual meeting in New Haven, Jan. 12, President Bishop called the meeting to order, when Mr. Goodwin protested against Mr. Bishop's presiding, as he had heretofore denied him a fair hearing, and moved that some one be selected to preside. The resolution was laid on the table. Another stockholder asked that a separate statement be made of the operations of the leased Harlem River and Portchester road, as none was made in the report. He had heard that \$2,000,000 bonds of this road had been issued. In answer to his questions the cost of the road was stated at \$2,521,343.21, of which \$2,000,000 was raised by sale of bonds, the balance by stock and advances. Mr. Bishop said that the road was begun by Le Grand Lockwood and others as an opposition line to New Haven. When Mr. Lockwood failed, the friends of the present company secured control of the new line. It was necessary to complete it in order to prevent other parties from building it, even though it was never expected to pay. The road was built for cash, but had cost much more than was expected; the cost of the land required was very much more than the expense of right of way for a road out in the country would have been. The branch is beginning to make a fair showing, but in any event it would have been better for the company to throw the money it had cost it into Long Island Sound, than to allow a competing road to be built. The accounts of the branch could not be kept separately without trouble and expense.

Mr. Goodwin asked what had been the effect of his injunction against free passes. Mr. Bishop said he did not know. There was some further talk between Mr. Goodwin and others, which had no special result.

The old board of directors was re-elected without change, receiving a nearly unanimous vote, except that some 5,000 shares were voted for Mr. Keeney, of Hartford, in place of Mr. Watrous.

##### Alabama & Chattanooga.

In the United States Circuit Court in Mobile, Ala., Jan. 13, Judge Woods gave his decision in this case. The opinion is very long and involves many technical legal points. It in substance sustains the report of Master Commissioner Phillips, and overrules most of the objections that were filed against said report. The allowance of John G. Stanton of about \$240,000 for the purchase of him in lands in Chattanooga, and which Master Phillips' report was in favor of, was disallowed on the ground that Stanton had no title to the land, and should not receive the purchase money until he could make the title, it appearing that a large lien for the purchase money was due on the land to DuBose's estate from whom it was bought; and it also appearing that other large sums were due to creditors of Stanton who had laid attachment on the land, and also that a suit was pending in Knoxville respecting the title, and the court ordered an inquiry to ascertain the state of the title, and amount of money at stake to perfect them. He reduced the attorney's charges for the trustees and receivers about \$25,000. The exceptions to the report of Mr. Phillips upon the subject of money spent in improving the road were sustained. Some other reductions of the amounts reported by Commissioner Phillips were reduced and in other respects the report of Mr. Phillips was mostly confirmed.

In the same court, Jan. 14, Judge Woods signed a decree vacating the office of Stanton and Loomis as trustees and receivers. They are required to turn over their accounts on Feb. 1 to the new trustees, David A. Wells, of Connecticut, Robert H. Smith and W. D. Dunn, of Alabama. The final decree, covering all details and claims, was to be signed the next week.

##### Lafayette, Muncie & Bloomington.

In the Indiana Circuit Court at Lafayette, Jan. 8, the application for a receiver for the Western Division, from Lafayette to the Illinois line, came up on a demurrer interposed by the Toledo, Wabash & Western. The Supreme Court has decided that the lease of the Division to that company is void, but the receiver of that road still continues to operate it and to receive the earnings, but does not pay interest or keep the road in repair. The lessor company applied for the appointment of a receiver for the Division in order to secure possession of the road and have its earnings applied to its maintenance and repair. The Wabash Company demurred that its receiver already had possession and that the Court could not appoint another receiver. The Court overruled the demurrer, holding that the appointment of a receiver for the lessee by the Ohio courts and his confirmation in Indiana was no bar to the present application. The lessee's counsel then moved for a change of venue on the ground of local prejudice. This was opposed, and a further hearing will be necessary.

##### Port Royal.

The shops of this road at Port Royal, S. C., are completed, and Receiver Wilson has gone north to make arrangements for the necessary tools. The road has felt the need of these repair shops very much.

##### Greenville & Columbia.

At the annual meeting in April last the stockholders voted to authorize a mortgage of \$3,000,000 on the road, of which \$2,500,000 were to be used in settling the outstanding debts, and the remaining \$500,000 to be held in trust to be used in paying for future extensions and additions to the property. The mortgage has been made to the Farmers' Loan & Trust Company of New York, as trustee, and the company is now offering for sale the \$2,500,000 of 20-year 7 per cent. bonds to be issued under it. They are offered at 75. The net earnings of the road for the past year were about \$245,000, more than enough to pay the interest.

##### Atlantic, Mississippi & Ohio.

The proposition made by this company to the English bond holders is that the two half coupons and one full coupon on the consolidated bonds, together with the 12 coupons up to and including Oct. 1, 1881, shall be delivered to two trustees, who shall hold them as security for the carrying out of the agreement and as protection against any unforeseen action on the part of other creditors. In place of these coupons shall be issued 12 interest warrants at the rate of 3 per cent., due April 1 and Oct. 1 of each year, and an income bond of an amount equal to the coupons already overdue and the 4 per cent. to be surrendered for the coming six years. This income bond shall bear 7 per cent. interest, payable each year out of the net earnings remaining after paying interest on the prior divisional mortgages, on which there has been no default. If any of the consolidated bonds held under the terms of the mortgage in



trust to exchange for the divisional bonds shall be released on account of the surrender of any of those bonds, the consolidated bonds so released shall be issued by the trustees in exchange for an equal amount of the income bonds, to be chosen by lot.

A report accompanying the proposal gives a history of the company's difficulties arising from the depression in business of the last two years, a statement of the debt, and a careful estimate of the probable gross and net earnings for six years to come. The amount of the divisional mortgages is now \$5,123,041; of the consolidated bonds, including unpaid coupons, \$5,206,415; and of the floating debt, \$1,056,341.

#### New York Cheap Transportation Association.

At the annual meeting in New York, Jan. 18, the President made an address reviewing the progress and work of the Association. The reports of the officers and that of the delegates to the Chicago Convention were presented. The committee on terminal facilities made a long report, setting forth the deficiencies of New York as compared with other Atlantic ports, and urging the imperative necessity for grain elevators, and for an elevated freight road to connect the railroad terminal with the wharves of the city. After electing officers and hearing some remarks on the condition of the State canals, the meeting adjourned.

#### New Jersey Midland.

The party opposed to the Balestier-Dole plan of reorganization have issued a long circular in reply to that recently issued by the Balestier Committee. It takes exceptions to the statements made by that committee in several points, claiming first that the amount required to put the road in good condition and meet its pressing liabilities is largely overestimated; that the taxes are not a pressing liability and the right of way claims of \$180,000 due for equipment now in use consists of two items, one of \$60,000 due to the Bristol & South Wales Wagon Company, of which \$11,000 has been postponed for a year and the balance is payable by monthly instalments; that the other \$120,000 is for 10 engines from the Rhode Island Locomotive Works, of which one was destroyed by fire, and the Receivers claim the right to return the others, deeming the price too large; that the claim made by the Unionville road is disputed; and that the amount borrowed by the Receivers is only \$18,000. The circular says that no further payments should be made on the Weehawken property until it is decided what to do with it, and that in any event this property is covered by a land mortgage, and bondholders are not liable for its payment. The amount due on bonds and mortgages it reports to be only \$48,724, most of which can be arranged by payment of the interest; that the Montclair Company is liable for half the amount claimed by the Hudson Company; that no immediate repairs are needed to the Dundee bridge, the repairs of the road can be paid for out of net earnings, and the equipment needed can be leased and paid for in monthly instalments on advantageous terms.

The circular further claims that the Receivers say that if \$200,000 of their certificates can be taken, they can provide for all pressing liabilities and the road will earn enough net to pay all deferred claims with interest on the certificates and the principal as they mature. It is also charged that the claim that the Receivers are co-operating with the Balestier committee is not strictly true, as the Receivers themselves state that they have always refrained from identifying themselves with any plan of reorganization, believing it their business to remain impartial and to administer the trust property only as temporary custodians.

It is charged that the \$1,500,000 bonds deposited with the Balestier committee are largely second-mortgage bonds, and that the majority of the first-mortgage bonds are opposed to that committee.

The gross earnings of the road for the five months ending Nov. 30 were \$272,219; net, \$59,602. In the operating expenses are included a considerable amount for labor and materials used in improvement of the property.

In view of all these considerations, the issuers of the circular believe that there is no real need of a new mortgage for \$1,000,000 or even \$500,000 to take precedence of the present first mortgage, and that the interests of bondholders will be best served by carrying out their plan, which will provide for present needs, and will give the first-mortgage bondholders the benefit of all the net earnings of the road at a comparatively early period. The circular is signed by Alexander Main, No. 152 Broadway, New York.

#### Chicago, Pekin & Southwestern.

At the annual meeting in Streator, Ill., Jan. 9, it was voted to reduce the number of directors from 15 to nine, and also to change the name of the company to Chicago & Southwestern. It was stated that the line will be ready to open for traffic from Streator to Joliet in about 90 days. The track was laid through on this extension Dec. 30. Its length we have not yet learned.

#### Eastern.

At the adjourned meeting of the bondholders in Boston, Jan. 15, there was some further discussion over the plan for mortgaging the road, which was fully set forth at the former meeting. General Butler, as counsel for the company, set forth the reasons in favor of the company's plan, and urged that bankruptcy proceedings would be followed by an inevitable wasting and loss of the assets. The meeting finally voted to approve of the plan. The committee appointed at the previous meeting nominated Charles Allen, Wm. P. Bacon and Willard P. Phillips as the three trustees required under the plan. They were approved by the meeting, and the committee was continued and charged to present the matter to the Legislature and petition for the necessary authority to enable the company to carry it out. The meeting then adjourned, subject to the call of the Chairman.

#### Dividends.

Dividends have been declared by the following companies:

Delaware & Hudson Canal, 5 per cent., semi-annual, payable Feb. 1.  
Cleveland, Columbus, Cincinnati & Indianapolis, 3 per cent., semi-annual, payable Feb. 1.  
Terre Haute & Indianapolis, 5 per cent., semi-annual, payable Jan. 24.  
Mount Carbon & Port Carbon, 6 per cent., payable Jan. 15.  
Mill Creek and Mine Hill, 5 per cent., payable Jan. 13.  
Schuylkill Valley Railroad & Navigation, 2½ per cent., payable Jan. 13.  
Columbus & Hocking Valley, 4 per cent., semi-annual, payable Feb. 10.

#### Toledo, Wabash & Western.

The Protective Committee gives notice that all stockholders, who wish to join in defending the foreclosure suit, must deposit the assessment of 25 cents per share before Feb. 1.

#### New York & Oswego Midland.

A hearing in the matter of the final decree in the foreclosure suit was had in the United States Circuit Court in New York, Jan. 15. The report of the master to whom several questions as to the leased roads were referred, was presented, and various exceptions thereto were taken and argued. The Utica, Clinton & Binghamton and the Rome & Clinton companies were represented by counsel, as were also the trustees and the bondholders.

#### Central Vermont.

In the Vermont Supreme Court, Jan. 13, the quo warranto case to determine the legality of the election of directors held

last May came up. The Page board desired a hearing, but the Smith board objected that there had not been sufficient time for taking testimony and that the Court could only hear at that time the question whether information could be filed at the present term. The Court decided that until the information was filed there was no case to hear, and unless the respondents showed cause to the contrary, the relators would be allowed to file it. The respondents (the Smith board) offered to show cause and the case was set for the next day.

Accordingly argument was begun Jan. 14, and continued two days, on the order. At its close the Court took the papers and reserved its decision.

#### Meetings.

The following companies will hold their annual meetings at the times and places given:

United States Rolling Stock Company, at the office, No. 74 Wall street, New York, Feb. 7, at noon.  
West Jersey, at the office in Camden, N. J., Feb. 8, at 11 a. m.

#### Memphis & Kansas City.

This company, after long waiting, is almost ready to begin work, and will in a few days advertise for proposals for grading, clearing and furnishing ties for the section of the road from Batesville, Ark., through Jacksonport and Augusta to Witsburg, about 70 miles.

#### Delaware & Bound Brook.

The Chancellor of New Jersey has dismissed the application to enjoin this company from using the Mercer & Somerset crossing at Hopewell pending the decision on the Pennsylvania Railroad Company's appeal from the award of the Commissioners. The Chancellor holds that it is manifestly not the intention of the law to stop the work when an appeal is taken from the Commissioners' award. The appeal, after all, can only change the amount of damages awarded, not the fact of the condemnation.

Work on the tracklaying from Yardleyville to Bound Brook is progressing rapidly, and it is thought that the rails will be down early in next month.

#### Cairo & St. Louis.

The dispatch announcing that the United States Circuit Court had dissolved the injunction to prevent this company from building a new line into the City of Cairo was not exactly correct. The court merely modified the injunction so as to permit the company to build a temporary line in case the waters of the Mississippi should make its original one unsafe. The order provides that the trustees of the Cairo city property, the complainants in the case, shall not be deprived of any right to sue in ejectment or to enjoin the company from using the new line, provided condemnation proceedings are not had under the State law within a reasonable time and the damages paid. It is expressly declared that the order does not decide the main point at issue, and that the complainants may build any levee or embankment necessary to protect the city, without reference to the track of the road, provided there is no unnecessary interference.

#### Erie Railway Conductors' Mutual Relief Association.

At the annual meeting in Port Jervis, N. Y., last week, this association was reported to be in a flourishing condition, with 231 members on its rolls. During the year past but three deaths have occurred, requiring an assessment of \$22.40 for the first and \$22.90 for each of the other two. The officers were re-elected and the next meeting appointed for the second Tuesday in January, 1877, at Hornellsville.

#### The Minnesota State Railroad Bonds.

In his annual message, Governor Davis, of Minnesota, re-harasses the history of these bonds and urges that it is the duty of the State to make provision for their payment. By foreclosure proceedings on the security given by the companies for the State bonds issued to them it acquired some 250 miles of graded road-bed, with the franchises and land grants, and the fact that it regranted these to other companies is no bar to its liability in the case.

#### Chicago, Milwaukee & St. Paul.

The Governor of Iowa has called attention to the fact that the old McGregor & Missouri River road, now owned by this company, has not been completed by Dec. 1, 1875, as required by the terms of the land grant. The law required that 450 sections should be decided to the company when the road reached Algona, and the balance when completed to the Little Sioux River. It has only been built to Algona, and the Legislature must decide whether to resume the forfeited balance of the grant, and what disposition to make of it.

It is said that several parties are desirous of securing the grant, and that there will be quite a fight over it.

#### Pennsylvania.

The train agents, or collectors, who received a partial trial some time ago, are to be again placed on the passenger trains of this company. It is now said that they are not to supersede the conductors in the collection of fares altogether, as they did on the previous trial, but are rather to assist and relieve them of part of their labors. It is thought that this assistance will be necessary during the season of travel to the Centennial, and the men are to be put on now so that they can become familiar with their duties before the press of increased travel comes.

#### New York Central & Hudson River.

A suit has been begun against this company to recover \$144,720.90 with interest and costs, which is claimed as internal revenue tax due on that part of the net profits which was carried to the sinking fund during the period in which the 5 per cent. tax on net earnings was levied.

#### Chicago, Dubuque & Minnesota.

The foreclosure suits against this company and the Chicago, Clinton & Dubuque in the United States Circuit Court have been set over to the May term. The Court held that they could not legally be tried at the present adjourned session.

At the annual meeting in Dubuque, Ia., Jan. 5, there was a sharp contest between the Boston and the Iowa interests, ending in the success of the latter and the re-election of the old board. The Boston party claim that the majority of the Iowa people was fraudulent, having been obtained by the unauthorized issue of new stock just before the election, indicating that some of these Dubuque directors have been to St. Albans to school.

#### Delaware, Lackawanna & Western—Morris & Essex Division.

The last heading between two of the shafts in the new tunnel through Bergen Point was broken through about 4 a. m. of Jan. 19, and several persons shortly afterward passed through the tunnel from end to end. A large amount of work still remains to be done to enlarge the tunnel to full size, but the work is being pushed forward rapidly by contractor McAndrew.

#### Chicago & Illinois River.

The proceedings in voluntary bankruptcy having been terminated, a number of the creditors have filed in the United States District Court in Chicago a petition to have the company declared an involuntary bankrupt.

#### Hannibal & St. Joseph.

The Hannibal Courier says: "In the past year the company have laid down 2,000 tons of steel rail, and over 60,000 new ties. It has also erected a new

bridge over Brush Creek at a cost of over \$5,000; another over Eureka Creek at a cost of over \$6,000; a third, over Bear Creek, near Hannibal; and a fire-proof tank at Clarence. A new coal shed has also been erected at this point, and a new coal shed at Clarence, and nearly all the passenger and freight houses along the entire line have been thoroughly repaired."

"With the beginning of the new year the road was divided into three divisions, as follows: From Hannibal and Quincy to Brookfield, which, including the Brookfield yards, will constitute the Eastern Division, P. W. Drew, Superintendent, located at Hannibal; from Brookfield to Kansas City, the Western Division, with W. W. Fagan, Superintendent, at Kansas City; and from Cameron to Atchison, the St. Joe Division, W. P. Stewart, Superintendent, located at St. Joseph."

#### Kansas City, Memphis & Mobile.

In the matter of the application for an injunction to prevent the sale of this company's property, the Court has decided that there are no grounds for granting the injunction. In view, however, of a legal doubt as to whether the Sheriff should sell the property as a whole or in sections, the sale has been postponed to Feb. 15.

#### Cooperstown & Susquehanna Valley.

This road, which runs from Cooperstown, N. Y., southward 16 miles to a junction with the Albany & Susquehanna, is to be sold at sheriff's sale. Most of the stock is owned by the towns along the line.

#### Central, of Iowa.

In the United States Circuit Court at Des Moines, Ia., Jan. 14, the foreclosure suit against this company was called for final disposition. There were present counsel for the trustee, for the joint committee of bondholders and for Messrs. Sage and Cowdrey, who lately filed a position to set aside the decree of foreclosure. A petition and motion presented by the latter asking to be made parties, and that the decree of the last term be modified, were argued at considerable length, and both were overruled. Leave was granted to counsel for Sage and Cowdrey to appeal, by filing, within 30 days, a bond in the sum of \$1,000,000 to cover damages and interest accruing on the bonds. Unless the appeal is taken on the above conditions, the road will be sold, as provided by the decree of Oct. 5, 1875.

#### Geneva, Hornellsville & Pine Creek.

Work on this road will, it is said, be prosecuted vigorously the coming season. Under present arrangements the contractors are to complete it from Geneva to Naples, 20 miles, by July 1, 1876, and to Wayland, 13 miles further, by July 1, 1877.

#### Indianapolis, Bloomington & Western.

The United States Circuit Court, in the suit brought by the Rogers Locomotive Works to recover 28 engines which have been in use on the road for several years, has decided in favor of the manufacturers and the Receiver will either have to give up possession of the engines or pay the makers. It is said that 20 of the engines require extensive repairs, only eight being in good condition. If the Receiver and the Rogers Company do not arrange for the purchase of the engines, a further suit will probably be required to determine what rent shall be paid for their use during the time they were on the road.

The three committees representing respectively the Danville, Urbana, Bloomington & Pekin first-mortgage bondholders, the Indianapolis, Bloomington & Western first-mortgage and the second-mortgage bondholders, have agreed upon a plan of reorganization, an outline of which is as follows:

The foreclosure to be completed, the road bought in and a new company to be organized, which shall issue the following securities:

First-mortgage bonds (\$17,327 per mile).....	\$3,500,000
Second-mortgage bonds (\$7,426 per mile).....	1,500,000
Stock } (\$16,485 per mile) { .....	2,500,000
Scrap } .....	890,000
Total (\$41,238 per mile) .....	\$8,390,000

Both first and second-mortgage bonds to bear interest from Oct. 1, 1876, at 4 per cent. for two years, 5 per cent. for two years more, and thereafter at 7 per cent., and to have 30 years to run, with a sinking fund of 1 per cent. The stock to have a dividend not exceeding 8 per cent., after interest on the bonds is paid, and any surplus after paying such dividend to go to a dividend on the scrip. The scrip to be convertible into stock after it shall have received one dividend of 7 per cent. These securities are to be divided as follows: \$2,000,000 first-mortgage bonds in exchange for the principal of the present Danville, Urbana, Bloomington & Pekin bonds, and \$1,500,000 for 50 per cent. of the Indianapolis, Bloomington & Western first; \$1,500,000 second-mortgage bonds for the remaining 50 per cent. of the latter. Of the stock, \$800,000 to be issued for the accrued interest and for difference in interest for four years to come on the Danville bonds; \$900,000 for accrued interest and difference in interest on the Indianapolis, Bloomington & Western firsts, and \$1,000,000 for 66½ per cent. of the principal of the second-mortgage bonds. The whole \$830,000 in scrip to be issued in exchange for 33½ per cent. of the principal of the second-mortgage bonds and for the accrued interest on those bonds. That is, each holder of a \$1,000 Danville, Urbana, Bloomington & Pekin bond will receive a \$1,000 first-mortgage bond and \$300 in stock of the new company; each \$1,000 Indianapolis, Bloomington & Western first-mortgage bond will be exchanged for a \$500 first-mortgage, a \$500 second-mortgage bond and \$300 in stock; each \$1,000 second-mortgage bond for \$666.67 in stock and \$333.33 in scrip.

The Western Extension bondholders are left out altogether and will have to conduct their own foreclosure and organize by themselves.

#### Pittsburgh, Wheeling & Kentucky.

This company has made a proposition to the counties of Ohio and Brooke, West Va., which hold \$315,000 of its stock, to the effect that it will complete the road, which is nearly all graded, in 18 months, provided the counties will turn their stock over to a trustee, to be transferred to the company when the road is finished. The counties some time since offered their stock to any one who would finish the road.

#### Memphis & Little Rock.

The property known as the Navy Yard in Memphis, Tenn., comprising some 75 acres, most of which is leased out, was sold in Memphis last week under a decree of the Chancery Court in a suit brought to enforce the payment of \$300,000 bonds, with interest from July 1, 1875. These bonds became due in 1872 and were secured by a mortgage on this Navy Yard property. The property was sold in lots, the total amount realized being \$117,034.

#### Canada Southern.

There is trouble between this company and its employees in Canada, to whom four months' pay is due. The company offers to pay them in currency, but the men demand gold, and the company threatens to discharge all who do not accept its terms.

#### Erie Southern.

Subscription to the stock of this proposed road have reached the amount of \$130,000, and surveys of the line from Erie, Pa., to Meadville will be begun at once.

#### Old Colony.

A correspondent writes us as follows: "In the record of Railroad Construction for 1875 in the last number of the Gazette I notice the extension of the Fall River, Warren & Providence road is not mentioned. The track was laid in Novem-



ber, 1875, from a point near the terminus of that road in Somerset over the new bridge across Taunton River to its connection with the Old Colony Railroad in Fall River, a distance of 2 1-16 miles. The road is owned by the Old Colony Railroad Company, and was opened to the public Dec. 6, 1875.

"The substructure of the new bridge over Taunton River consists of cast-iron pneumatic cylinders 8 feet in diameter sunk to the requisite depth, the material excavated from the bottom and the columns filled with masonry. The depth of water in the channel is about 60 feet, and some of the piers are sunk from 30 to 40 feet below the bed of the river. The superstructure consists of five spans of 155 feet each and a draw span of 180 feet, making a total length of iron bridge of 955 feet. The approaches to the bridge are of wood, making a total length of about 1,300 feet. The bridge was built by the American Bridge Company of Chicago, under the superintendence of the Old Colony Railroad Company, and is one of the best bridges in the country."

#### Fond du Lac, Amboy & Peoria.

This company, which purposes building a narrow-gauge road from Peoria, Ill., north by east to Fond du Lac, Wis., about 220 miles, with possible branches to Chicago and Milwaukee, is trying to make arrangements to begin work in the Spring. A large issue of bonds has been authorized, and efforts are being made to sell them to the people along the line.

#### Lake Shore & Michigan Southern.

A general reduction of 10 per cent. has been made in the wages of all employes except agents and foremen in charge of departments.

#### Scioto Valley.

This road is now completed from Columbus, O., southward to Ashville, about 12 miles, and trains will shortly be put on that section, the line being continued to Circleville by stages, which will be gradually withdrawn as the track advances. The grading between Circleville and Chillicothe is being pushed forward.

#### New York & Long Island Bridge.

The President of this company states that work on the proposed bridge over the East River at Blackwell's Island, New York, will be begun in the spring. Meantime the plans for the bridge have been referred to a board of consulting engineers, composed of Gens. J. G. Barnard and Q. A. Gillmore, United States Engineers, and Mr. Octave Chanute, of the Erie Railway.

#### Utica, Ithaca & Elmira.

Coal trains began to run through from Elmira, N. Y., to Cortland last week, and passenger trains began to make regular trips through, Jan. 17.

#### Richmond & Washington.

Much local interest is felt in the application to the Virginia Legislature for a charter for a new road from Richmond, Va., to Quantico, to be a parallel and competing line to the Richmond, Fredericksburg & Potomac. The application is in the interest of the Richmond & Danville and the Pennsylvania Railroad Company, and its discussion promises to occupy a good part of the time of the Legislature at its present session.

#### New York Elevated.

The recently completed extension of 1 1/2 miles from Thirty-fourth to Sixty-first street, New York, was formally opened for travel Jan. 17. The company expects a large increase in travel from this extension which carries it as far up as Central Park.

#### Missouri, Kansas & Texas.

The Amsterdam committee of bondholders announced Dec. 31, that the Union Pacific Southern Branch Coupons would not be paid Jan. 1, when due, there being great dissensions between the company and the committee concerning details in the conditions of the arrangement which was adopted July 26. The committee says that the request of the trustees, that pending the litigation the Receiver should pay the sum agreed upon under the arrangement, has not been attended to. The committee hoped after the request had been brought before the court, as was to be done Jan. 12, harmony would be established again.

#### Delaware, Lackawanna & Western.

The transfer of the coal depot from Elizabethport to Hoboken is complete, and the tracks and yards at Elizabethport have been leased to the Central of New Jersey. The work on the new docks, the canal and other improvements at Hoboken is being pushed forward and rapid progress is being made.

#### Paxton & Danville.

The stockholders have offered to give the road-bed, which is nearly all graded, to the Illinois Central, provided that company will iron the road and work it as a branch. It is about 35 miles long, from the Central at Paxton, Ill., southeast to Danville.

#### Tennessee Railroad Taxation.

The Nashville (Tenn.) American, of Jan. 8, says: "The Louisville & Nashville Railroad Company came forward yesterday, accepted the 11th section of the Act of March 20, 1875, regulating the taxation of railroads and paid over to Gov. Porter \$25,273, 1 1/2 per cent. on the gross earnings of all the railroads operated by the company in this State. In adopting this policy the company voluntarily surrendered its claims to exemption from taxation contained in the charters of several of their railroads, and agreed to be taxed upon them in the future, in accordance with the provisions of the law."

#### Grand Southern.

A delegation of persons interested in this line has been in conference with the Provincial Government for the purpose of securing an addition of \$1,000 per mile to the subsidy of \$5,000 per mile already granted. If the \$6,000 per mile can be secured, it is said that contractors are willing to build the road and take the rest of their pay in its securities. The road is to run from St. John, N. B., westward and nearly parallel with the coast to St. Stephen, whence it will be extended to Bangor by the projected Bangor & Calais Shore Line road.

#### St. Louis & Southeastern.

In the foreclosure suit of Calhoun and Opdyke, trustees under the consolidated mortgage, in the United States Circuit Court at Springfield, Ill., Jan. 11, the Court ordered a decree to be entered, which requires the Receiver to set aside one-half the net earnings of the road to pay the interest on the first mortgage, and it also appoints Henry W. Smithers and Charles W. Opdyke special trustees to constitute a board of audit, to pass upon all accounts against the road.

The first mortgage bondholders have been made parties defendant to the suit.

#### Green Bay & Minnesota.

This company has applied to Congress for the necessary authority to build at Winona, Minn., a pontoon bridge across the Mississippi, similar to the one now in use between Prairie du Chien and McGregor.

#### Oregon & California.

The San Francisco Alta California says, "An important transfer of Pacific Coast railway rights has just been consummated, by which control of the Oregon railroad system will pass into new hands. The majority of the stock of the Oregon railroads, of which Ben Holladay is president, has been transferred to the German bondholders, who agree to supply the

necessary funds for completing their construction. It is now said that the construction of the roads will be immediately pushed to a rapid completion."

#### Ebensburg & Cherrytree.

A movement is on foot for a railroad from Ebensburg, Pa., the terminus of the Ebensburg Branch of the Pennsylvania Railroad, north by west to Cherrytree, about 20 miles.

#### St. Louis, Keokuk & Northwestern.

This company has concluded an arrangement with the Toledo, Peoria & Warsaw by which through freight will be carried to and from Quincy and Hannibal in connection with that road.

#### Cincinnati Southern.

A bill has been introduced in the Ohio Legislature to authorize the trustees to borrow \$6,000,000 in addition to the \$10,000,000 originally provided for. The Consulting Engineer, Mr. Thomas D. Lovett, has submitted estimates of the probable cost of the road complete, without equipment. He states that the actual amount of work done, up to Nov. 1, was \$6,378,773, or about 51 per cent. of the whole of the grading, masonry and bridging. The whole estimate, including the Ohio River bridge and approaches, is as follows:

	Under contract.	Not yet let.	Total.
Grading.....	\$6,222,714 06	\$1,103,226 45	\$7,325,940 51
Masonry.....	2,175,796 77	329,877 27	2,505,674 04
Bridges.....	1,021,703 00	1,189,358 05	2,211,061 05
Totals.....	\$9,820,213 83	\$2,622,461 77	\$12,442,675 60
Cattle guards.....		5,000 00	5,000 00
Track.....		3,389,717 50	3,389,717 50
Telegraph line.....		28,752 00	28,752 00
Total.....			\$15,816,086 70

It will be seen that, even if the estimates are not exceeded, there will be very little left out of the additional \$6,000,000. The local subscriptions at Chattanooga will be just about sufficient to pay for the terminal property and improvements there. The estimate provides for 132 miles steel track, 204 miles iron main track and 25 miles of sidings.

#### Chicago, Danville & Vincennes.

Receiver Anderson has filed in the United States Circuit Court in Chicago an account of his receipts and disbursements for October, November and December, as follows:

Balance on hand Oct. 1.....	\$27,766 66
Receipts from traffic, etc.....	242,054 73
From former receivers.....	562 22
Sundries.....	99 20
Total.....	\$270,512 81
Paid on accounts, vouchers, etc.....	\$201,018 65
Reduction of floating debt.....	25,277 31
For former receivers.....	472 77
Total.....	221,768 73

Balance, Jan. 1.....\$43,744 08  
From a supplementary account it appears that the Receiver has received on account of Messrs. Hammond and Brown, the former receivers, \$40,255.03, and disbursed \$59,189.94, leaving a balance against them of \$18,934.91. The report was referred to a master for examination.

#### Atlantic & Lake Erie.

The directors have finally concluded a contract with Vibbard, Ball & Co., of New York, for the completion of the line from Chautauque, in Athens County, O., north by west to Bucyrus in Crawford County, a distance of 121 miles. The line is to be ready for business in 15 months. The contractors have sublet 31 miles, from Bremen to Granville, to Merritt & Eaton, and will sublet the rest of the grading soon.

#### Wabash & Erie Canal.

This canal is to be sold at auction Feb. 24, at Terre Haute, Ind., by Samuel B. Gookins, Special Master, and Thomas Dowling, Resident Trustee, under a decree of the United States Circuit Court, at the suit of Jonathan K. Gopen. The sale will include the canal from Evansville, Ind., to the Ohio State line and a number of lots and parcels of land held by the trustees. The canal will be sold in sections varying from 13 to 25 miles in length. The terms are 10 per cent. in cash; the balance will be allowed to remain one year at 6 per cent. interest and on approved security. The whole length of the canal is about 380 miles.

#### Poughkeepsie Bridge.

The Poughkeepsie (N. Y.) Eagle says that a conditional contract has been made for the construction of the bridge over the Hudson at that point. The price agreed upon is \$3,000,000, the contractors to receive \$1,000,000 in cash and \$2,000,000 in bonds of the company. The work is to be begun whenever the company is prepared to pay the cash payment required.

#### Cleveland & Pittsburgh.

The Farmers' Loan & Trust Company, trustee, gives notice that 14 of the construction and equipment bonds of this company have been drawn by lot for purchase by the sinking fund. The principal of the bonds will be paid on presentation at the trustee's office in New York, and interest on them will cease July 1. The numbers of the bonds drawn are: 3, 41, 53, 67, 81, 98, 145, 175, 216, 256, 464, 716, 1245, 1811.

#### Southern Minnesota.

Holders of certificates issued in exchange for such 8 per cent. bonds as have all the unpaid coupons attached will receive 3 per cent. or \$30 per bond, on presenting the certificates to the Farmers' Loan & Trust Company, No. 26 Exchange place, New York, for the purpose of having the amount of such payment stamped thereon.

#### Sunbury & Lewistown.

The bondholders, for whose account this road was bought in at foreclosure sale over a year ago, met in Philadelphia, Jan. 6, and organized a new company. Another meeting will be held Jan. 25, when a report on the present condition of affairs will be presented and the future course of the company decided on.

#### Warwick Valley.

This company reports its net earnings for the year ending Sept. 30, 1875, as follows:

Net earnings.....	\$20,319 19
Interest on bonds.....	\$4,200
Dividends on stock.....	15,750
	19,950 00
Surplus.....	\$369 19

The road is 10 miles long, from Greycourt, N. Y., to Warwick. Train service is furnished under contract by the Erie.

#### Boston & Albany.

Mr. F. B. Hayes, one of the State directors, has made a minority report to the Legislature, which is in the nature of an attack upon the present management. He was opposed to the maintenance of the 10 per cent. dividend rate on account of the falling off in receipts and the necessity for reducing the wages of the employees. He also thinks that many of the charges to construction account for new bridges, difference of cost between steel and iron rails and other items should have been included in expenses. He also thinks that premium on stock and bonds sold should not be included in surplus income, and that provision should be made for the contingency of having to pay back internal revenue taxes. He claims that the increase in construction account has been out of propor-

tion with the growth of business. He also refers to the Ware River lease, charging that some of the directors held stock in that road, which was benefited by the lease. He thinks that the State should require the managers to observe stricter economy and to prefer the public interest to all private ones. He also charges that a former State director was really a stockholder, and that he also profited by selling gravel to a contractor for the road. The other State directors do not sign this report.

Notice is given that the Albany city bonds issued in aid of the Western Railroad, which fall due July 1, 1876, will be paid on presentation at the office of the Treasurer of the Boston & Albany Railroad Company in Boston.

#### Pittsburgh & Northwestern.

The company has executed a mortgage for \$1,800,000 to the Union Trust Company of New York as trustee, and it is said that arrangements have been made to negotiate the bonds. A considerable force is now employed on the grading at Perryville. The company has concluded an arrangement to buy the Lawrenceville & Evergreen road, thus securing an entrance into the city independent of the negotiations now pending for right of way.

#### Connecticut Valley.

The lease of the Springfield & New London road has been finally completed and signed. Regular trains from Saybrook to Springfield will be put on Jan. 24, when two mixed trains will begin to run, and passenger trains will shortly follow. It is not expected that there will be, for the present at any rate, any considerable reduction of rates from Springfield.

#### Montpelier & Wells River.

In St. Johnsbury, Vt., Jan. 10, the application for the appointment of a receiver in the foreclosure suit came up before the Vermont Chancery Court. Counsel for the complainants in the suit asked for the appointment of Mr. D. R. Sortwell, who claims to be the largest holder of the securities. Counsel for N. C. Munson asked for delay in order that they might file a cross-bill to protect a claim for work done as contractor, which was a first lien on the property. Mr. Sortwell's appointment was opposed by the stockholders and also by Nathan Matthews, of Boston, who furnished the iron for the road and took bonds in payment. After considerable discussion, the court appointed a further hearing for Feb. 4.

#### Rockford, Rock Island & St. Louis.

In the United States Circuit Court in Chicago, Jan. 12, the Court authorized the Receiver to pay from the balance in his hands a number of small bills for supplies, amounting in all to \$16,868.02 to parties in Chicago, and \$9,448.34 to parties in St. Louis. The Receiver was also allowed \$1,000 for his services in November. The claim of the Indianapolis & St. Louis Company for rental due was referred to the master for further examination and report.

Mr. Osterberg, who bought this road at foreclosure sale for account of the German bondholders, has been visiting Rockford, Ill., in the interest of a proposed extension of the road from the present terminus at Sterling northeast to Rockford.

#### Woodland & Tehama.

The grading of this branch of the California Pacific up the west side of the Sacramento Valley is now completed for some 50 miles northward from Woodland, Cal. Rails and other material for the track are being collected at Woodland.

#### Chico & Colusa.

A survey is being made for this proposed narrow-gauge road from Colusa on the Sacramento River northward to Chico, Cal., a distance of about 40 miles.

#### Denver & Rio Grande.

This company has made great progress in the construction of its Trinidad Extension during the past few months, and at the close of 1875 had two miles of track laid on it not included in our annual record last week. The company has iron for 100 miles of track on the ground, all of which it intends to have laid within the next three months. Trinidad is within about ten miles of New Mexico, and 150 of Santa Fe, and with the road completed so far it will probably secure the entire New Mexican trade.

#### Hot Springs.

The track has been extended on this road from Lawrence westward 4 1/2 miles, making it 22 1/2 miles long from Malvern. The contractors hoped to complete the road into Hot Springs by the evening of the 15th.

#### Train Accidents in December.

On the morning of the 1st a passenger train on the St. Louis, Keokuk & Northwestern ran off the track four miles south of West Quincy, Mo., blocking the track four hours. A broken axle under the tender was the cause.

On the morning of the 1st a steer broke through the door of a stock car in a train on the Central, of Iowa, when near Grinnell, Ia. The steer fell upon the track and threw the following car from the rails, wrecking it badly.

On the 1st some 12 cars of a freight train on the Vermont Central road were thrown from the track near Winooski, Vermont, blocking the road all day.

On the afternoon of the 1st, at East Buffalo, N. Y., on the New York Central & Hudson River road, an east bound express train ran into a coal train which was crossing from the main track to a siding. The engine and several coal cars were badly wrecked and three passenger cars were upset, one of them being badly broken. A passenger and the flagman at the switch were crushed under the wreck and hurt so badly that they died in a short time, and nine others were injured besides a number slightly bruised. The fast mail was due at that point just at the time of the accident, but the engineer fortunately saw the wreck and succeeded in stopping his train within a few feet of it. It is charged that the proper signals were not displayed to warn the express that the coal train was crossing the track, and a coroner's jury subsequently found a verdict severely censuring the company for keeping an insufficient number of flagmen and for imperfect signals at that point.

On the evening of the 1st, in Peoria, Ill., an Indianapolis, Bloomington & Western passenger train was thrown from the track by a misplaced switch.

A switching engine sent to its assistance went off the track at another misplaced switch, having been signaled to come on in spite of the fact that the switch was open.

A short time afterwards a Peoria, Pekin & Jacksonville passenger train ran off near the same spot, making three engines off the rails close together.

On the evening of the 1st a car in a west-bound freight train on the Erie Railway got off the track near Hawthorne, N. J., and ran nearly two miles before the train was stopped, little damage being done and no other car being thrown off.

On the night of the 1st a train on the Palisade & Eureka road was thrown from the track near Eureka, Nev., by a loose rail. It is supposed that the spikes had been removed for the purpose of wrecking the train.

On the night of the 1st a passenger train on the Kansas Pacific road struck a cow near Denver, Col., and the engine went into the ditch and was badly broken. The road was blocked four hours.

On the evening of the 2d the engine and two cars of a freight train on the Erie Railway were thrown from the track by a rail which had been laid across the track.



On the morning of the 3d the engine and several cars of a train on the Alabama & Chattanooga road were thrown from the track near Toombs, Ala., by the spreading of the rails.

On the 3d a train on the Houston & Texas Central Railroad was thrown from the track at a wash-out in the road-bed near Courtney, Tex., killing one man and injuring two others.

An engine which was dispatched to assist the wrecked train ran into a culvert which had been washed away near the same place and by the same storm.

On the night of the 3d seven cars of a mixed train on the Jacksonville, Pensacola & Mobile road were thrown from the track near Monticello Junction, Fla., by a loose rail. The conductor was badly hurt.

Early on the morning of the 7th the fast mail train on the New York Division of the Pennsylvania Railroad was thrown from the track at the Harsimus Branch Junction in Jersey City, N. J., and ran over upon the opposite track into the head of an east bound freight which was just approaching. Both engines were badly broken and the road blocked five hours. The accident is said to have been caused by a misplaced switch.

On the morning of the 7th a car of a stock train on the Toledo, Wabash & Western road ran off the track at Hamilton, Ill. On the 7th nine cars of a freight train on the Indianapolis & Vincennes road was thrown from the track by the spreading of the rails, near Martinsville, Ind.

On the morning of the 8th a freight train on the Peoria, Pekin & Jacksonville Railroad was thrown from the track near Havana, Ill., by the spreading of the rails. Fourteen cars went into the ditch and were badly broken, blocking the road all day.

On the 8th an express train on the Pittsburgh, Cincinnati & St. Louis road ran into a freight train which was just going on a siding at Dinmore, Pa., wrecking three cars and damaging the express engine.

On the morning of the 9th the tender of a passenger train on the Keokuk Branch of the Chicago, Burlington & Quincy ran off the track near Keokuk, Ia.

On the morning of the 9th six cars of a freight train on the Peoria, Pekin & Jacksonville road were thrown from the track by the spreading of the rails near Havana, Ill., blocking the road three hours. This was the second accident on the same road from the same cause in a few days.

On the 9th, as an engine was taking water at Morris, Mich., on the Chicago & Michigan Lake Shore road, a train was carelessly backed up upon it, doing some damage to the engine and a car.

On the 9th a passenger train on the Pensacola & Louisville road was thrown from the track by a broken rail near Bluff Springs, Ala., damaging the engine and two cars and injuring a passenger somewhat.

On the morning of the 10th a north-bound freight train on the Oil Creek & Allegheny River road came to a halt near Shaffer, Pa., the engine having given out. Signals were put out, but, owing to some mistake as to the signal given by the flagman, a south-bound train, which came up soon after, was not stopped, and ran into the halted train, damaging both engines badly. The conductor of the south-bound train and Road Supervisor Hilliard, who was on board, were injured, besides several persons slightly bruised.

On the morning of the 10th a boiler of the engine of a passenger train on the Macon & Brunswick road exploded, wrecking the engine and baggage car, and killing the engineer.

On the morning of the 10th a freight train on the Memphis & Charleston road ran into the rear of a passenger train which was standing at White's, Tenn., wrecking several cars and injuring two passengers badly. The passenger train had no signal on the rear car, it is said.

On the 10th the engine and tender of a local train on the New York & Harlem road was thrown from the track by a misplaced switch at Woodlawn, N. Y.

On the morning of the 11th a freight train on the Portsmouth & Dover Railroad broke in two near Dover, N. H., and the rear section subsequently ran into the forward one, throwing one car from the track and wrecking it, and damaging two others. A brakeman was somewhat injured.

On the morning of the 11th the pay-train on the Maine Central road ran into a hand car near West Waterville, Me., destroying the car, killing a section foreman and one laborer and hurting another badly.

On the 11th, a passenger train on the St. Louis & Southeastern road was thrown from the track at Trenton, Ky., by a misplaced switch, and the engine upset, damaging itself badly and blocking the road 12 hours. The switch is believed to have been set wrong by an employee recently discharged, who hoped to throw the blame upon the fireman.

On the morning of the 12th, a train on the Alabama & Chattanooga road, with a circus on board struck a broken rail at Sowashee Bridge, Ala., throwing several cars from the track, killing one of the circus-men, injuring three others, and setting loose several of the animals.

On the 12th, a freight train on the Grand Trunk Railway was thrown from the track at Carleton, Ont., by a broken axle and the car, under which the axle was, was thrown upon the station platform, and several others were piled up on it, making a bad wreck.

On the night of the 12th, the engine and tender of a train on the Alabama Central road were thrown from the track at Bigbee Bridge, Ala., doing a little damage. The accident was caused by the spreading of the rails at the point where the draw joined the fixed span.

Late on the night of the 12th, a switching engine on the Erie Railway ran off the track in the Jersey City yard, blocking the track leading to the passenger house for an hour or more.

Very early on the morning of the 13th an express train on the New York, Providence & Boston road was thrown from the track by a misplaced switch at Westerly, R. I. The engine and two cars ran off, obstructing both tracks so that it took nearly twelve hours to clear them. The switch is said to have been purposely misplaced, the lock having been broken by some heavy instrument.

About noon on the 13th eight cars of a freight train on the Keokuk & Des Moines road were thrown from the track near Des Moines, Ia., by a broken wheel, and some of them were badly wrecked, blocking the road some hours.

On the afternoon of the 13th a train on the Louisiana Branch of the Chicago & Alton was thrown from the track by the spreading of the rails near Roodhouse, Ill. The engine and tender went into the ditch and were badly broken.

On the night of the 13th, as a freight train on the Vicksburg & Meridian road was going up the grade at Big Black River, Miss., with one engine pulling and another pushing, the boiler of the rear engine exploded, wrecking it completely. The engine was an old one and had been used as helper on this grade for some time.

On the night of the 13th a west-bound freight train on the Erie Railway ran off the track at Oxford, N. Y.

On the morning of the 14th a freight train on the Vicksburg & Meridian road was thrown from the track near Midway, Miss., two freight cars and the caboose going into the ditch and injuring a man who was riding in the caboose. The accident is said to have been caused by a defective rail-joint.

On the night of the 14th, as a freight train on the Boston & Albany road was near Chariton, Mass., the rear car broke loose and ran back down a grade and into the head of a following train, smashing the front of the engine, injuring the engineer and completely wrecking itself. The wreck of the car caught fire and was burned up.

On the 15th, a train on the Indianapolis & St. Louis road

ran off the track near Greencastle, Ind., blocking the road two hours.

On the 15th, a train on the Arkansas Central road struck a hand car near Marvell, Ark., wrecking it and killing a section hand.

On the evening of the 15th a coal train on the Central Railroad of New Jersey was thrown from the track by a misplaced switch on the long bridge over Newark Bay. The engine remained on the bridge, but a number of cars were piled up on the tender and five of them went into the bay. The road was blocked nearly all night.

Early on the morning of the 17th, as a train on the Georgia Railroad had just started from Barnett, Ga., the boiler of the engine exploded, tearing it to pieces and scattering fragments of the boiler and engine for a long distance around. The engineer was very badly hurt and the fireman killed. The engine was about 15 years old, but was thought to be in excellent condition.

On the evening of the 17th a train on the Northeastern Railroad struck a log which had been placed upon the track near Charleston, S. C., throwing the engine and two cars from the track.

On the 18th, in Columbus, O., there was a butting collision between a Baltimore & Ohio train and a locomotive, by which both engines were badly damaged, and an engineman and two others hurt.

On the evening of the 19th a freight train on the St. Paul & Sioux City road broke in two near St. James, Minn., and one car broke off by itself and ran off the track and down a bank, clearing the track altogether, so that the engine was backed up and the train coupled together again without perceiving in the darkness that the car was missing.

On the morning of the 20th a freight train on the Dakota Southern road ran into a land-slide near Sioux City, Ia., throwing the engine from the track and wrecking it.

On the 20th, as an express train on the New York Central & Hudson River was stopping for water at Palmyra, N. Y., a freight train struck it in the rear, starting it ahead suddenly and damaging its own engine slightly.

On the 20th, as an engine on the Nashua, Acton & Boston road was running upon the turn-table at Nashua, N. H., it ran off the track and fell into the pit, killing the engineman.

On the afternoon of the 20th, as a train on the Washington Branch of the Baltimore & Ohio was near Alexandria Junction, the side rod of the engine broke, delaying the train some time.

On the night of the 20th nine cars of a freight train on the Houston & Texas Central road were thrown from the track near Courtney, Tex., blocking the road for some time.

On the morning of the 21st, as an express train on the Morris & Essex Division of the Delaware, Lackawanna & Western road was entering the Hoboken yard, it ran over a misplaced switch and into some coal cars which were standing on a siding, breaking several of them and damaging the engine and baggage car.

On the evening of the 21st a passenger train on the Keokuk Branch of the Chicago, Burlington & Quincy ran off the track near Fort Madison, Ia.

On the evening of the 21st an express train on the New York Central & Hudson River was thrown from the track at Canastota, N. Y., by a misplaced switch, the whole train leaving the rails, and blocking the road five hours. It was afterwards found that the switch rod had been disconnected and the switch set wrong without changing the signal.

Very early on the morning of the 22d some cars of a coal train on the New York Division of the Pennsylvania Railroad ran off the track at Princeton Junction, N. J., blocking the road some time.

Early on the morning of the 22d a freight train on the Illinois Central road ran into the rear of a passenger train near Centralia, Ill., breaking a sleeping coach badly and damaging its own engine. There was a thick fog at the time.

On the morning of the 22d there was a butting collision between a freight and a construction train on the Cincinnati, Hamilton & Dayton road, near Hamilton, O., by which several cars were wrecked. The engine man of the freight jumped and was fatally hurt.

On the 22d, at Catlin, Ill., on the Toledo, Wabash & Western Railway, a freight train on a side track did not clear, and another freight ran into it, damaging an engine and several cars and delaying trains six hours.

On the 22d a freight train on the Houston & Texas Central road ran off the track near Rice, Tex.

On the night of the 22d two cars of a passenger train on the Houston & Texas Central road ran off the track near Dallas, Tex., blocking the road till morning.

Early on the morning of the 23d a passenger train ran into the rear of a freight train on the Louisville & Nashville road at the Short Line Junction, near Louisville, Ky. An engine and several cars were wrecked, the engineman very badly and the fireman less severely hurt. The morning was dark and the freight had no signals out.

On the morning of the 23d three cars of a freight train on the Charlotte, Columbia & Augusta road were thrown from the track by a defective joint on a high bank near Fort Mills, S. C., and went down the bank. In one of the cars were several kegs of powder which exploded and set fire to the wreck, which was completely destroyed.

On the evening of the 23d, a mixed train on the Connecticut Western Railroad was thrown from the track at State Line, Conn., by a misplaced switch. The engine was wrecked and five cars went down a bank, injuring one of the trainmen badly.

On the morning of the 25th, as a freight train on the Pittsburgh, Cincinnati & St. Louis road was going up a grade near Greenville, O., several cars broke loose and ran back into the head of a following train, wrecking the engine and several cars and injuring the fireman badly.

On the morning of the 26th, a passenger train on the Philadelphia & Reading road ran into a land-slide near Pottsville, Pa., throwing the engine from the track and doing some slight damage.

About noon on the 26th, an express train on the Atlantic & Great Western road was thrown from the track by the spreading of the rails just at the entrance to a covered bridge over Bucktooth Run, near Salamanca, N. Y. The engine, tender and baggage car remained on the ties, but the smoking-car struck the posts of the bridge and was badly broken; the remaining cars went some 20 feet down a bank, the first one rolling completely over and the others falling on their sides. The passengers were well shaken up, and five persons were somewhat injured, besides a number of slight bruises.

On the night of the 26th, two cars of an express train on the Atlanta & Richmond Air Line were thrown from the track near Whitaker's, S. C., blocking the road some time and injuring a passenger.

On the morning of the 27th a freight train on the Missouri, Kansas & Texas road got stalled on the grade just outside of Denison, Tex. A switching engine went to its assistance but owing to the slippery state of the track did not stop quite soon enough and ran into the stalled train, damaging both engines.

On the afternoon of the 27th a passenger train on the Georgia Railroad ran into the head of a construction train, which was just backing into a siding at Dearing's, Ga., injuring both engines slightly.

Early on the morning of the 28th an express train on the Vermont Central struck a broken rail near Middlesex, Vt. The engine and baggage car passed over safely but the mail car was thrown against the rocks of a cut which the train was just entering and badly broken; the second passenger car was thrown

40 feet from the track down a bank, landing on the roof; the first sleeping car also went down and rolled over and the second was thrown around at right angles to the track. Twenty-two passengers were injured, besides a number bruised slightly.

On the morning of the 28th the rear car of a freight train on the Missouri Pacific ran off the track near Pomeroy, Mo., and then broke loose from the train, running over a bridge and some distance beyond on the ties and finally upsetting into the ditch.

On the afternoon of the 28th the engine of a freight train on the Erie Railway ran off the track at Swain's, N. Y., delaying trains two hours.

On the night of the 28th a mixed train on the Central Railroad of Georgia struck a horse which had got fast in the trestle at Williamson's Swamp, Ga., and the engine, nine freight, the baggage and one passenger car ran off the track, the engine and several freight cars going off the trestle and breaking themselves badly. The engineman was caught under the engine and scalded to death; the fireman and a passenger were hurt.

On the night of the 28th an express train on the Indianapolis, Cincinnati & Lafayette road was thrown from the track in Indianapolis, Ind., by a misplaced switch, blocking the approach to the Union Depot two hours.

Very early on the morning of the 29th a freight train on the New York Central & Hudson River road ran into the rear of a preceding train, which had stopped for water at Batavia, N. Y. The engine and 35 cars were badly wrecked, the damage being very great.

On the morning of the 29th a freight train on the Oil Creek & Allegheny River road ran into a land-slide near Shaffer, Pa., throwing the engine and several oil and coal cars from the track and wrecking them badly. The slide and wreck together blocked the road a day.

On the morning of the 29th the engine of an accommodation train on the Columbus, Chicago & Indiana Central road was thrown from the track by a broken rail at Lansing, Ind., delaying the train three hours.

On the 29th an accommodation train on the Columbus, Chicago & Indiana Central ran off the track in Chicago.

On the 29th a train on the Mobile & Ohio road was struck by a tornado near Winfrey, Tenn., and the whole train blown over and off the track.

On the afternoon of the 30th, an express train on the Erie Railway was thrown from the track by a misplaced switch at the Newark Branch Junction in Paterson, N. J.

On the morning of the 31st, as a train on the Manchester & Lawrence road was near Londonderry, N. H., the connecting-rod on the locomotive broke, and the loose end broke a steam pipe near the cab, disabling the engine and scalding the engineman.

This is a total of 84 accidents, whereby 12 persons were killed and 62 injured. Ten accidents caused the death of one or more persons, fourteen caused injury but not death, while 60, or 71.4 per cent. of the whole, caused no hurt serious enough for record.

These accidents may be classified as to their nature and causes as follows:

COLLISIONS: Rear collisions ..... 12 Butting collisions ..... 8 — 20

DERAILMENTS: Unexplained ..... 19 Misplaced switch ..... 11 Spreading of rails ..... 7 Broken rail ..... 4 Land-slide ..... 3 Wash-out ..... 2 Loose rail ..... 2 Defective joint ..... 2 Broken axle ..... 2 Cattle on track ..... 2 Malicious obstruction ..... 1 Accidental obstruction ..... 1 Broken wheel ..... 1 Wind ..... 1 — 59

Boiler explosion ..... 3 Broken connecting rod ..... 2 —

Total ..... 84

Five collisions were caused by the lack of, or failure to use signals, to which also several others can apparently be referred; three were caused by trains breaking in two, one each by a misplaced switch, by fog, by carelessness in side-tracking and by slippery condition of track. Besides two malicious obstructions there were three switches purposely misplaced and one rail unfastened with intent to wreck a train. Twenty-six accidents were caused directly by defect or failure of road or equipment.

The number of accidents is still quite large, although the weather of the present winter thus far has been unusually favorable. Two unpleasant features of this month's record are the continued large number of misplaced switches and the number of accidents caused by want of proper signals. It may be that economy both in number and pay of employees has been carried too far in some cases, and that carelessness on the part of overworked or discontented men is the result. The number of accidents caused by spreading of rails and defective joints is unusually large, and the indications are that many of the 19 unexplained derailments can be traced to bad condition of track, also the result of undue, but in many cases enforced economy.

As compared with December, 1874, there is an increase of 10 in the number of accidents and of 13 injured; the number killed is the same. The number killed and injured was unusually small in comparison with the number of accidents.

For the year ending with December the record is as follows:

	No. of accidents.	Killed.	Injured.
January	131	10	96
February	211	11	186
March	122	17	73
April	60	9	67
May	54	6	43
June	61	23	67
July	73	38	60
August	114	27	110
September	116	50	182
October	88	12	74
November	87	24	97
December	84	12	62
Totals	1,201	234	1,107

The averages per day for the month were 2.71 accidents, 0.39 killed and 2 injured; for the year there were 3.29 accidents, 0.64 killed and 3.03 injured. The average per accident were for the month 0.14 killed and 0.74 injured; for the year, 0.19 killed and 0.92 injured. The year, which opened with an extraordinary number of accidents, closes now with a month rather below its average, though quite up to that recorded in former years.